

* * * * * STN Columbus * * * * *

FILE 'HOME' ENTERED AT 15:18:22 ON 08 MAY 2002

=> index

ENTER FILE OR CLUSTER NAMES (NONE):all

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
9.03	9.03

FULL ESTIMATED COST

INDEX '1MOBILITY, 2MOBILITY, ADISALERTS, AEROSPACE, AGRICOLA, ALUMINIUM,
ANABSTR, AQUASCI, BABS, BIBLIODATA, BIOBUSINESS, BIOCOMMERCE, BIOSIS,
BIOTECHABS, BIOTECHDS, BIOTECHNO, BLLDB, CABA, CANCERLIT, CAPLUS, CBNB,
CEABA-VTB, CEN, CERAB, CHEMSAFE, CIN, ...' ENTERED AT 15:44:20 ON 08 MAY 2002

123 FILES IN THE FILE LIST IN STNINDEX

=> s biolumines? and (toy# or gun# or novelty item#)

FILE '1MOBILITY'

2 BIOLUMINES?
119 TOY#
100 GUN#
28 "NOVELTY"
909 ITEM#
0 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE '2MOBILITY'

0 BIOLUMINES?
2 TOY#
14 GUN#
0 "NOVELTY"
91 ITEM#
0 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ADISALERTS'

18 BIOLUMINES?
15 TOY#
55 GUN#
23 NOVELTY
1892 ITEM#
0 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'AEROSPACE'

202 BIOLUMINES?
136 TOY#
8864 GUN#
370 NOVELTY
8453 ITEM#
0 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'AGRICOLA'

529 BIOLUMINES?
275 TOY#
391 GUN#
227 NOVELTY
4583 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ALUMINIUM'

0 BIOLUMINES?
439 TOY#
709 GUN#
199 NOVELTY
7069 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ANABSTR'

387 BIOLUMINES?
116 TOY#
309 GUN#
12 NOVELTY
165 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'AQUASCI'

1204 BIOLUMINES?
88 TOY#
445 GUN#
108 "NOVELTY"
4963 ITEM#
1 NOVELTY ITEM#
 ("NOVELTY"(W) ITEM#)
1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BABS'

192 BIOLUMINES?
14 TOY#
68 GUN#
55 NOVELTY
112 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIBLIODATA'

45 BIOLUMINES?
125 TOY#
464 GUN#
4 NOVELTY
120 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIOBUSINESS'

273 BIOLUMINES?
487 TOY#
342 GUN#
417 "NOVELTY"
2788 ITEM#
30 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIOCOMMERCE'

119 BIOLUMINES?
232 TOY#
175 GUN#
18 NOVELTY
34 ITEM#
1 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIOSIS'

3781 BIOLUMINES?
1197 TOY#
3745 GUN#
2822 NOVELTY
27619 ITEM#
4 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
3 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIOTECHABS'

376 BIOLUMINES?
57 TOY#
422 GUN#
76 NOVELTY
75 ITEM#
2 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIOTECHDS'

376 BIOLUMINES?
57 TOY#
422 GUN#
76 NOVELTY
75 ITEM#
2 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIOTECHNO'

1247 BIOLUMINES?
155 TOY#
603 GUN#
371 NOVELTY
636 ITEM#
0 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BLDDB'

0 BIOLUMINES?
10 TOY#
5 GUN#
8 NOVELTY
355 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CABA'

712 BIOLUMINES?
429 TOY#
1386 GUN#
619 NOVELTY
9203 ITEM#
8 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CANCERLIT'

185 BIOLUMINES?
24 TOY#
560 GUN#
95 NOVELTY
2036 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CAPLUS'

5258 BIOLUMINES?
2663 TOY#
18171 GUN#
2172 NOVELTY
11505 ITEM#
17 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
5 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CBNB'

33 BIOLUMINES?
2743 TOY#
255 GUN#
94 NOVELTY
8102 ITEM#
4 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CEABA-VTB'

279 BIOLUMINES?
119 TOY#
265 GUN#
41 NOVELTY
2020 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)

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0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CEN'
10 BIOLUMINES?
122 TOY#
171 GUN#
51 "NOVELTY"
963 ITEM#
2 NOVELTY ITEM#
  ("NOVELTY"(W) ITEM#)
1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CERAB'
0 BIOLUMINES?
5 TOY#
154 GUN#
3 NOVELTY
148 ITEM#
0 NOVELTY ITEM#
  (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CHEMSAFE'
0 BIOLUMINES?
0 TOY#
0 GUN#
0 NOVELTY
0 ITEM#
0 NOVELTY ITEM#
  (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CIN'
61 BIOLUMINES?
3109 TOY#
590 GUN#
82 "NOVELTY"
8338 ITEM#
4 NOVELTY ITEM#
  ("NOVELTY"(W) ITEM#)
2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'COMPENDEX'
279 BIOLUMINES?
735 TOY#
12135 GUN#
1618 NOVELTY
15531 ITEM#
5 NOVELTY ITEM#
  (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'COMPUAB'
3 BIOLUMINES?
108 TOY#
199 GUN#
280 "NOVELTY"
2082 ITEM#
0 NOVELTY ITEM#

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        ("NOVELTY"(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'COMPUSCIENCE'
    0 BIOLUMINES?
    291 TOY#
    60 GUN#
    306 NOVELTY
    3000 ITEM#
    0 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CONFSCI'
    248 BIOLUMINES?
    54 TOY#
    536 GUN#
    58 "NOVELTY"
    211 ITEM#
    0 NOVELTY ITEM#
        ("NOVELTY"(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'COPPERLIT'
    0 BIOLUMINES?
    5 TOY#
    45 GUN#
    2 NOVELTY
    10 ITEM#
    0 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CORROSION'
    8 BIOLUMINES?
    3 TOY#
    157 GUN#
    6 NOVELTY
    300 ITEM#
    0 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CROPB'
    3 BIOLUMINES?
    6 TOY#
    39 GUN#
    1 NOVELTY
    4 ITEM#
    0 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CROPU'
    78 BIOLUMINES?
    11 TOY#
    332 GUN#
    40 NOVELTY
    87 ITEM#

```

0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CSNB'

2 BIOLUMINES?
69 TOY#
60 GUN#
1 NOVELTY
375 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'DDFB'

51 BIOLUMINES?
56 TOY#
117 GUN#
15 NOVELTY
9 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'DDFU'

95 BIOLUMINES?
216 TOY#
87 GUN#
78 NOVELTY
251 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'DETERM'

0 BIOLUMINES?
2 TOY#
0 GUN#
0 NOVELTY
0 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'DKF'

0 BIOLUMINES?
67 TOY#
78 GUN#
8 NOVELTY
9 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'DKILIT'

8 BIOLUMINES?
313 TOY#
36 GUN#
13 NOVELTY

84 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'DGENE'

1159 BIOLUMINES?
129 TOY#
120 GUN#
759 NOVELTY
363 ITEM#
83 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
127 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'DRUGB'

51 BIOLUMINES?
56 TOY#
117 GUN#
15 NOVELTY
9 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'DRUGNL'

0 BIOLUMINES?
15 TOY#
13 GUN#
0 "NOVELTY"
5 ITEM#
0 NOVELTY ITEM#
 ("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'DRUGU'

188 BIOLUMINES?
244 TOY#
177 GUN#
118 NOVELTY
1372 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ELCOM'

11 BIOLUMINES?
23 TOY#
710 GUN#
145 "NOVELTY"
397 ITEM#
0 NOVELTY ITEM#
 ("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'EMA'

3 BIOLUMINES?
64 TOY#
376 GUN#

35 NOVELTY
871 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'EMBAL'

24 BIOLUMINES?
4 TOY#
34 GUN#
39 NOVELTY
451 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'EMBASE'

2235 BIOLUMINES?
1183 TOY#
3274 GUN#
2357 "NOVELTY"
26446 ITEM#
1 NOVELTY ITEM#
 ("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ENCOMPLIT'

47 BIOLUMINES?
426 TOY#
291 GUN#
35 NOVELTY
968 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ENCOMPLIT2'

47 BIOLUMINES?
426 TOY#
291 GUN#
35 NOVELTY
968 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ENCOMPPAT'

3 BIOLUMINES?
183 TOY#
209 GUN#
41622 NOVELTY
194 ITEM#
2 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ENCOMPPAT2'

3 BIOLUMINES?
183 TOY#

209 GUN#
41622 NOVELTY
194 ITEM#
2 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ENERGY'

358 BIOLUMINES?
598 TOY#
9208 GUN#
459 NOVELTY
19582 ITEM#
1 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ENTEC'

29 BIOLUMINES?
41 TOY#
373 GUN#
69 NOVELTY
763 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ESBIOBASE'

1034 BIOLUMINES?
132 TOY#
751 GUN#
878 NOVELTY
5124 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'EUROPATFULL'

598 BIOLUMINES?
5880 TOY#
15646 GUN#
3318 NOVELTY
42951 ITEM#
50 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
24 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'FOMAD'

0 BIOLUMINES?
112 TOY#
25 GUN#
276 NOVELTY
16651 ITEM#
2 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'FORIS'

0 BIOLUMINES?

1 TOY#
2 GUN#
1 NOVELTY
103 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'FROSTI'

626 BIOLUMINES?
170 TOY#
139 GUN#
484 NOVELTY
2721 ITEM#
18 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'FSTA'

395 BIOLUMINES?
92 TOY#
131 GUN#
221 NOVELTY
4063 ITEM#
14 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'GENBANK'

204 BIOLUMINES?
86 TOY#
3486 GUN#
170 "NOVELTY"
90 ITEM#
76 NOVELTY ITEM#
 ("NOVELTY"(W) ITEM#)
27 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'GEOREF'

24 BIOLUMINES?
93 TOY#
1164 GUN#
158 NOVELTY
1262 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'HEALSAFE'

34 BIOLUMINES?
45 TOY#
192 GUN#
21 "NOVELTY"
890 ITEM#
0 NOVELTY ITEM#
 ("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ICONDA'

1 BIOLUMINES?
223 TOY#
304 GUN#
133 NOVELTY
831 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'IFIPAT'

303 BIOLUMINES?
14508 TOY#
20210 GUN#
2612 NOVELTY
26806 ITEM#
152 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
7 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'IFICLS'

0 BIOLUMINES?
12 TOY#
21 GUN#
0 NOVELTY
17 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'INFODATA'

0 BIOLUMINES?
24 TOY#
9 GUN#
65 NOVELTY
1149 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'INPADOC'

238 BIOLUMINES?
20135 TOY#
22471 GUN#
779 NOVELTY
9741 ITEM#
89 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
11 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'INSPEC'

446 BIOLUMINES?
2046 TOY#
15690 GUN#
2669 NOVELTY
21149 ITEM#
4 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'INSPHYS'

41 BIOLUMINES?
66 TOY#
1401 GUN#
37 NOVELTY
531 ITEM#
0 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'INVESTEXT'

60 BIOLUMINES?
74512 TOY#
15937 GUN#
5258 "NOVELTY"
1551116 ITEM#
368 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'IPA'

18 BIOLUMINES?
18 TOY#
50 GUN#
9 NOVELTY
1363 ITEM#
0 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ISMEC'

2 BIOLUMINES?
32 TOY#
516 GUN#
54 "NOVELTY"
833 ITEM#
0 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ITRD'

1 BIOLUMINES?
38 TOY#
120 GUN#
54 NOVELTY
2257 ITEM#
0 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'JICST-EPLUS'

753 BIOLUMINES?
1770 TOY#
4180 GUN#
224 NOVELTY
28955 ITEM#
0 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'KOSMET'

31 BIOLUMINES?
1 TOY#
2 GUN#
16 NOVELTY
92 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'LIFESCI'

1663 BIOLUMINES?
150 TOY#
721 GUN#
1123 "NOVELTY"
4537 ITEM#
1 NOVELTY ITEM#
 ("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'MATBUS'

2 BIOLUMINES?
338 TOY#
378 GUN#
22 NOVELTY
1619 ITEM#
1 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'MATH'

0 BIOLUMINES?
227 TOY#
103 GUN#
627 NOVELTY
4020 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'MATHDI'

0 BIOLUMINES?
79 TOY#
2 GUN#
13 NOVELTY
911 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'MEDLINE'

2129 BIOLUMINES?
1215 TOY#
4005 GUN#
2224 NOVELTY
30140 ITEM#
1 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)

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0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'METADEX'
    5 BIOLUMINES?
    80 TOY#
    3061 GUN#
    99 NOVELTY
    7390 ITEM#
    0 NOVELTY ITEM#
      (NOVELTY (W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'NAPRALERT'
    20 BIOLUMINES?
    3 TOY#
    23 GUN#
    2 "NOVELTY"
    24 ITEM#
    0 NOVELTY ITEM#
      ("NOVELTY" (W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'NIOSTIC'
    15 BIOLUMINES?
    38 TOY#
    360 GUN#
    14 NOVELTY
    1215 ITEM#
    0 NOVELTY ITEM#
      (NOVELTY (W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'NLDB'
    197 BIOLUMINES?
    17903 TOY#
    21682 GUN#
    3203 "NOVELTY"
    104177 ITEM#
    168 NOVELTY ITEM#
      ("NOVELTY" (W) ITEM#)
    6 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'NTIS'
    449 BIOLUMINES?
    332 TOY#
    10992 GUN#
    451 NOVELTY
    26029 ITEM#
    1 NOVELTY ITEM#
      (NOVELTY (W) ITEM#)
    1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'OCEAN'
    547 BIOLUMINES?
    17 TOY#
    264 GUN#
    29 "NOVELTY"
    1676 ITEM#
    0 NOVELTY ITEM#

```

```

        ("NOVELTY"(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PAPERCHEM2'
    14 BIOLUMINES?
    293 TOY#
    220 GUN#
    71 NOVELTY
    1911 ITEM#
    7 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PASCAL'
    2149 BIOLUMINES?
    1041 TOY#
    4945 GUN#
    3759 NOVELTY
    17986 ITEM#
    1 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
    1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PATDD'
    2 BIOLUMINES?
    0 TOY#
    4 GUN#
    0 NOVELTY
    1 ITEM#
    0 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PATDPA'
    64 BIOLUMINES?
    1 TOY#
    109 GUN#
    0 NOVELTY
    20 ITEM#
    0 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PATOSDE'
    28 BIOLUMINES?
    2 TOY#
    86 GUN#
    0 NOVELTY
    7 ITEM#
    0 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
    0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PATOSEP'
    63 BIOLUMINES?
    944 TOY#
    3296 GUN#
    798 NOVELTY
    6831 ITEM#

```

6 NOVELTY ITEM#
 (NOVELTY (W) ITEM#)
1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PATOSWO'

78 BIOLUMINES?
869 TOY#
1418 GUN#
228 NOVELTY
4232 ITEM#
21 NOVELTY ITEM#
 (NOVELTY (W) ITEM#)
1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PCTFULL'

3436 BIOLUMINES?
5391 TOY#
25003 GUN#
4181 NOVELTY
43634 ITEM#
192 NOVELTY ITEM#
 (NOVELTY (W) ITEM#)
544 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PHIC'

1 BIOLUMINES?
1 TOY#
2 GUN#
0 "NOVELTY"
29 ITEM#
0 NOVELTY ITEM#
 ("NOVELTY" (W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PHIN'

61 BIOLUMINES?
377 TOY#
373 GUN#
231 "NOVELTY"
4385 ITEM#
0 NOVELTY ITEM#
 ("NOVELTY" (W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PIRA'

17 BIOLUMINES?
1087 TOY#
637 GUN#
235 "NOVELTY"
5529 ITEM#
15 NOVELTY ITEM#
 ("NOVELTY" (W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'POLLUAB'

157 BIOLUMINES?
42 TOY#
100 GUN#
22 "NOVELTY"

677 ITEM#
0 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PROMT'

274 BIOLUMINES?
75623 TOY#
33870 GUN#
16372 "NOVELTY"
307296 ITEM#
1457 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
10 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'RAPRA'

9 BIOLUMINES?
3013 TOY#
1575 GUN#
109 NOVELTY
73398 ITEM#
13 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'RSWB'

1 BIOLUMINES?
126 TOY#
138 GUN#
142 NOVELTY
442 ITEM#
0 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'RUSSCI'

10 BIOLUMINES?
18 TOY#
235 GUN#
32 NOVELTY
566 ITEM#
0 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'SCISEARCH'

3662 BIOLUMINES?
1848 TOY#
9268 GUN#
3482 NOVELTY
22997 ITEM#
1 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'SIGLE'

53 BIOLUMINES?
103 TOY#
199 GUN#

85 NOVELTY
351 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'SOLIDSTATE'

12 BIOLUMINES?
14 TOY#
400 GUN#
46 "NOVELTY"
124 ITEM#
0 NOVELTY ITEM#
 ("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'SOLIS'

0 BIOLUMINES?
74 TOY#
29 GUN#
19 NOVELTY
751 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'SYNTHLINE'

0 BIOLUMINES?
2 TOY#
0 GUN#
0 "NOVELTY"
0 ITEM#
0 NOVELTY ITEM#
 ("NOVELTY"(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'TEXTILETECH'

9 BIOLUMINES?
161 TOY#
184 GUN#
1258 NOVELTY
3638 ITEM#
30 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'TIBKAT'

42 BIOLUMINES?
59 TOY#
169 GUN#
5 NOVELTY
100 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'TOXCENTER'

1781 BIOLUMINES?
502 TOY#

1904 GUN#
817 NOVELTY
7465 ITEM#
4 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'TRIBO'

0 BIOLUMINES?
3 TOY#
241 GUN#
3 NOVELTY
127 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'TULSA'

15 BIOLUMINES?
26 TOY#
2726 GUN#
67 NOVELTY
957 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'TULSA2'

6 BIOLUMINES?
20 TOY#
2121 GUN#
2 NOVELTY
30 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'UFORDAT'

45 BIOLUMINES?
0 TOY#
6 GUN#
3 NOVELTY
17 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'ULIDAT'

510 BIOLUMINES?
16 TOY#
19 GUN#
20 NOVELTY
245 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'USPATFULL'

2499 BIOLUMINES?

31444 TOY#
64648 GUN#
43012 NOVELTY
199015 ITEM#
934 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
165 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'USPAT2'

3 BIOLUMINES?
61 TOY#
139 GUN#
63 NOVELTY
653 ITEM#
1 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'WELDASEARCH'

0 BIOLUMINES?
19 TOY#
3071 GUN#
6 NOVELTY
874 ITEM#
0 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'WPIDS'

459 BIOLUMINES?
18973 TOY#
37538 GUN#
1847582 NOVELTY
70613 ITEM#
219 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
9 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'WPINDEX'

459 BIOLUMINES?
18973 TOY#
37538 GUN#
1847582 NOVELTY
70613 ITEM#
219 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
9 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'WSCA'

16 BIOLUMINES?
223 TOY#
1150 GUN#
29 NOVELTY
467 ITEM#
1 NOVELTY ITEM#
 (NOVELTY(W) ITEM#)
0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'WTEXTILES'

```

      8 BIOLUMINES?
     54 TOY#
     76 GUN#
    609 NOVELTY
    961 ITEM#
      2 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)
      0 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

```

L1 QUE BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

=> fil

agricola,aquasci,biocommerce,biosis,biotechds,caba,hcapl,cbnb,cen,cin,frosti,nldb,nt
is,pascal,prompt,scisearch,toxcenter,wpids

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
11.13	20.16

FULL ESTIMATED COST

FILES 'AGRICOLA, AQUASCI, BIOCOMMERCE, BIOSIS, BIOTECHDS, CABA, HCAPLUS, CBNB,
CEN, CIN, FROSTI, NLDB, NTIS, PASCAL, PROMT, SCISEARCH, TOXCENTER, WPIDS'
ENTERED AT 15:56:55 ON 08 MAY 2002

ALL COPYRIGHTS AND RESTRICTIONS APPLY. SEE HELP USAGETERMS FOR DETAILS.

18 FILES IN THE FILE LIST

=> s 11

FILE 'AGRICOLA'

```

     529 BIOLUMINES?
     275 TOY#
     391 GUN#
     227 NOVELTY
    4583 ITEM#
      0 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)

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L2 1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'AQUASCI'

```

    1204 BIOLUMINES?
      88 TOY#
     445 GUN#
     108 "NOVELTY"
    4963 ITEM#
      1 NOVELTY ITEM#
        ("NOVELTY"(W) ITEM#)

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L3 1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIOCOMMERCE'

```

     119 BIOLUMINES?
     232 TOY#
     175 GUN#
      18 NOVELTY
     34 ITEM#
      1 NOVELTY ITEM#
        (NOVELTY(W) ITEM#)

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L4 2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIOSIS'

```

    3781 BIOLUMINES?
    1197 TOY#

```

3745 GUN#
2822 NOVELTY
27619 ITEM#
4 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L5 3 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'BIOTECHDS'

376 BIOLUMINES?
57 TOY#
422 GUN#
76 NOVELTY
75 ITEM#
2 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L6 2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CABA'

712 BIOLUMINES?
429 TOY#
1386 GUN#
619 NOVELTY
9203 ITEM#
8 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L7 1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'HCAPLUS'

5258 BIOLUMINES?
2663 TOY#
18171 GUN#
2172 NOVELTY
11505 ITEM#
17 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L8 5 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CBNB'

33 BIOLUMINES?
2743 TOY#
255 GUN#
94 NOVELTY
8102 ITEM#
4 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L9 1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CEN'

10 BIOLUMINES?
122 TOY#
171 GUN#
51 "NOVELTY"
963 ITEM#
2 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
L10 1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'CIN'

61 BIOLUMINES?

3109 TOY#
590 GUN#
82 "NOVELTY"
8338 ITEM#
4 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
L11 2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'FROSTI'
626 BIOLUMINES?
170 TOY#
139 GUN#
484 NOVELTY
2721 ITEM#
18 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L12 2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'NLDB'
197 BIOLUMINES?
17903 TOY#
21682 GUN#
3203 "NOVELTY"
104177 ITEM#
168 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
L13 6 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'NTIS'
449 BIOLUMINES?
332 TOY#
10992 GUN#
451 NOVELTY
26029 ITEM#
1 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L14 1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PASCAL'
2149 BIOLUMINES?
1041 TOY#
4945 GUN#
3759 NOVELTY
17986 ITEM#
1 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L15 1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'PROMT'
274 BIOLUMINES?
75623 TOY#
33870 GUN#
16372 "NOVELTY"
307296 ITEM#
1457 NOVELTY ITEM#
("NOVELTY"(W) ITEM#)
L16 10 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'SCISEARCH'

3662 BIOLUMINES?
1848 TOY#
9268 GUN#
3482 NOVELTY
22997 ITEM#
1 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L17 2 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'TOXCENTER'

1781 BIOLUMINES?
502 TOY#
1904 GUN#
817 NOVELTY
7465 ITEM#
4 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L18 1 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

FILE 'WPIDS'

459 BIOLUMINES?
18973 TOY#
37538 GUN#
1847582 NOVELTY
70613 ITEM#
219 NOVELTY ITEM#
(NOVELTY(W) ITEM#)
L19 9 BIOLUMINES? AND (TOY# OR GUN# OR NOVELTY ITEM#)

TOTAL FOR ALL FILES

L20 51 L1

=> dup rem l20

DUPLICATE IS NOT AVAILABLE IN 'BIOCOMMERCE'.
ANSWERS FROM THESE FILES WILL BE CONSIDERED UNIQUE
PROCESSING COMPLETED FOR L20

L21 36 DUP REM L20 (15 DUPLICATES REMOVED)

=> d tot

L21 ANSWER 1 OF 36 PROMT COPYRIGHT 2002 Gale Group

ACCESSION NUMBER: 2001:177677 PROMT
TITLE: Navy Shipbuilding Faces Funding Crisis.(Brief Article)
AUTHOR(S): THOMPSON, LOREN B.
SOURCE: Navy News & Undersea Technology, (26 Feb 2001) Vol. 18, No.
9, pp. 5.
ISSN: 8756-1700.
PUBLISHER: King Communications Group, Inc.
DOCUMENT TYPE: Newsletter
LANGUAGE: English
WORD COUNT: 2220
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L21 ANSWER 2 OF 36 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
TI Cloning and sequencing of Renilla green fluorescent protein and luciferase
and their use in diagnostics, high throughput screening and
bioluminescence generating systems
SO PCT Int. Appl., 175 pp.

CODEN: PIXXD2

IN Bryan, Bruce J.; Szent-Gyorgyi, Christopher; Szczepaniak, William
AN 2001:693483 HCAPLUS
DN 135:253492

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001068824	A2	20010920	WO 2001-US8277	20010315
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				

L21 ANSWER 3 OF 36 WPIDS (C) 2002 THOMSON DERWENT

TI Manufactured goods obtained from photoprotein for fish baits, comprises natural or recombinant photoprotein comprising apo aequorin, light emission substrate and molecular oxygen, which emits light with calcium.

PI JP 2001240855 A 20010904 (200206)* 4p C09K011-07

L21 ANSWER 4 OF 36 AGRICOLA

DUPLICATE 2

TI Comparison of destructively and rinsing gained samples to determine TVC of pig carcasses by **bioluminescence**.

SO Meat science, Oct 2001. Vol. 59, No. 2. p. 165-168

Publisher: Oxford : Elsevier Science Limited.

CODEN: MESCDN; ISSN: 0309-1740

AU Werlein, H.D.

AN 2002:5179 AGRICOLA

L21 ANSWER 5 OF 36 (c) 2002 FAO (on behalf of the ASFA Advisory Board) All rights reserved.

AN 2002:58530 AQUASCI

DN ASFA1 2002

TI Introduction of Green Fluorescent Protein and Lac-Z Gene into Zebrafish (Danio rerio) Egg by Microinjection and Particle Gun

AU Chen, Jyh-Yih; Yang, Jer-Yen; Wang, Jyh-I; Wu, Jen-Leih*

CS Institute of Zoology, Academia Sinica, Taipei, Taiwan, R.O.C.

SO Journal of the Fisheries Society of Taiwan [J. Fish. Soc. Taiwan], (20010600) vol. 28, no. 2, pp. 91-103.

ISSN: 0379-4180.

DT Journal

FS ASFA1

LA UNAVAILABLE

L21 ANSWER 6 OF 36 COPYRIGHT 2002 Gale Group

DUPLICATE 3

AN 2000:200276 NLDB

TI SCIENCE SCAN DNA SUBUNIT MEASLES VACCINE PROTECTS ALL 14 PRIMATE MODELS FROM WILD-TYPE VIRAL CHALLENGE.

SO BIOWORLD Today, (13 Jul 2000) Vol. 11, No. 134.

PB American Health Consultants, Inc.

DT Newsletter

LA English

WC 1027

L21 ANSWER 7 OF 36 COPYRIGHT 2002 Gale Group

AN 2000:33137 NLDB
TI EUROPEAN PATENT DISCLOSURES PRIVATE.
SO BIOWORLD Today, (8 Feb 2000) Vol. 11, No. 25.
PB American Health Consultants, Inc.
DT Newsletter
LA English
WC 1931

L21 ANSWER 8 OF 36 PROMT COPYRIGHT 2002 Gale Group

ACCESSION NUMBER: 2000:971390 PROMT
TITLE: Prolume aglow with its genetic entertainment. (**Toys**
lead the way to **bioluminescent** therapeutics and
diagnostics.)
SOURCE: Genetic Engineering News, (1 Feb 2000) Vol. 20, No. 3, pp.
37(2).
ISSN: 0270-6377.
PUBLISHER: Mary Ann Liebert, Inc.
DOCUMENT TYPE: Newsletter
LANGUAGE: English

L21 ANSWER 9 OF 36 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE
4

TI **Bioluminescent novelty items.**
SO Official Gazette of the United States Patent and Trademark Office Patents,
(Nov. 28, 2000) Vol. 1240, No. 4, pp. No Pagination. e-file.
ISSN: 0098-1133.
AU Bryan, Bruce (1)
AN 2001:267193 BIOSIS

L21 ANSWER 10 OF 36 WPIDS (C) 2002 THOMSON DERWENT

TI Novel recombinant nucleic acid molecules that encode the apophoprotein of
pholasin or its homologous sequence useful for detecting location and
measurement of oxygen and its metabolites in living cells and organs.
PI WO 2000028025 A1 20000518 (200033)* EN 50p C12N015-12
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: AU CA JP US
AU 2000011687 A 20000529 (200041) C12N015-12
EP 1124957 A1 20010822 (200149) EN C12N015-12
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
RO SE SI
IN CAMPBELL, A K

L21 ANSWER 11 OF 36 WPIDS (C) 2002 THOMSON DERWENT

TI Novel items designed for entertainment, recreation and amusement comprises
a combination of commercial product such as soap, **toys** and
components of a **bioluminescence** generating system and/or a
fluorescent protein.
PI US 6113886 A 20000905 (200055)* 64p A61K007-16
IN BRYAN, B

L21 ANSWER 12 OF 36 WPIDS (C) 2002 THOMSON DERWENT

TI Process of producing fluorescence and light-emission from light-emitters
for cladding traffic signs, internally, externally involves irradiating
light-emitter and contacting with luciferase, metal ion.
PI JP 2000169840 A 20000620 (200041)* 7p C09K011-07

L21 ANSWER 13 OF 36 CIN COPYRIGHT 2002 ACS

AN 29(9):8876J CIN
TI Corporate Profile: Prolume aglow with its genetic entertainment
SO Genet. Eng. News, 1 Feb 2000 (20000201), 20(3), p. 37, 50. ISSN:
0270-6377; CODEN: GENNDX.
LA English

L21 ANSWER 14 OF 36 SCISEARCH COPYRIGHT 2002 ISI (R)
TI Prolume aglow with its genetic entertainment - **Toys** lead the way
to **bioluminescent** therapeutics and diagnostics
SO GENETIC ENGINEERING NEWS, (1 FEB 2000) Vol. 20, No. 3, pp. 37-&. Publisher: MARY ANN LIEBERT INC PUBL, 2 MADISON AVENUE, LARCHMONT, NY 10538.
ISSN: 0270-6377.
AU Potera C
AN 2000:125776 SCISEARCH

L21 ANSWER 15 OF 36 CBNB COPYRIGHT 2002 EI
AN 16(5):6836 CBNB
TI New meaning for gene **gun** in **toy** glow-in-dark water pistol.
SO Biotechnology Newswatch (17 Jan 2000), 1,6-7, (200-899 words) ISSN: 0275-3685
DT Journal
LA English
PY 2000

L21 ANSWER 16 OF 36 PROMT COPYRIGHT 2002 Gale Group

ACCESSION NUMBER: 1999:530893 PROMT
TITLE: Fighting Fusarium.
AUTHOR(S): Wood, Marcia; Comis, Don; Hardin, Ben; McGraw, Linda; Stelljes, Kathryn Barry
SOURCE: Agricultural Research, (June 1999) Vol. 47, No. 6, pp. 18. ISSN: 0002-161X.
PUBLISHER: Superintendent of Documents
DOCUMENT TYPE: Newsletter
LANGUAGE: English
WORD COUNT: 1814
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L21 ANSWER 17 OF 36 PROMT COPYRIGHT 2002 Gale Group

ACCESSION NUMBER: 2000:677473 PROMT
TITLE: Glow In The Dark Food.(Brief Article)
SOURCE: The Food Institute Report, (29 Mar 1999) . ISSN: 0745-4503.
PUBLISHER: American Institute of Food Distribution, Inc.
DOCUMENT TYPE: Newsletter
LANGUAGE: English
WORD COUNT: 207
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L21 ANSWER 18 OF 36 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE
5
TI **Bioluminescent novelty items.**
SO Official Gazette of the United States Patent and Trademark Office Patents, (March 2, 1999) Vol. 1220, No. 1, pp. 488.
ISSN: 0098-1133.
AU Bryan, B.

AN 1999:145198 BIOSIS

L21 ANSWER 19 OF 36 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 6
TI Luciferases, fluorescent proteins, nucleic acids encoding the luciferases
and fluorescent proteins and the use thereof in diagnostics, high
throughput screening and **novelty items**
SO PCT Int. Appl., 233 pp.
CODEN: PIXXD2
IN Bryan, Bruce J.; Szent-Gyorgyi, Christopher
AN 1999:626311 HCAPLUS
DN 131:267970

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	WO 9949019	A2	19990930	WO 1999-US6698	19990326
	WO 9949019	A3	20000629		
	W:	AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	CA 2324648	AA	19990930	CA 1999-2324648	19990326
	AU 9932103	A1	19991018	AU 1999-32103	19990326
	EP 1064360	A2	20010103	EP 1999-914203	19990326
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO			
	US 6232107	B1	20010515	US 1999-277716	19990326
	JP 2002507410	T2	20020312	JP 2000-537980	19990326

L21 ANSWER 20 OF 36 CIN COPYRIGHT 2002 ACS
AN 28(15):149502 CIN
TI Food that glows in the dark
SO N. Y. Times (N. Y. Ed.), 22 Mar 1999 (19990322), p. C6. ISSN: 0362-4331;
CODEN: NYTIAO.
LA English

L21 ANSWER 21 OF 36 COPYRIGHT 2002 Gale Group DUPLICATE 7

AN 1999:48043 NLDB
TI **Bioluminescence** is marketing's newest rising star.
SO About Women & Marketing, (19 Dec 1998) Vol. 11, No. 12.
PB About Women, Inc.
DT Newsletter
LA English
WC 90

L21 ANSWER 22 OF 36 COPYRIGHT 2002 Gale Group

AN 1998:192733 NLDB
TI Food That Glows in the Dark
SO Industries In Transition, (1 Jul 1998) Vol. 26, No. 3.
PB Business Communications Company, Inc
DT Newsletter
LA English
WC 324

L21 ANSWER 23 OF 36 COPYRIGHT 2002 Gale Group

AN 1998:187751 NLDB
TI ENZYMES: Food that Glows in the Dark
SO Food Ingredient News, (1 Jul 1998) Vol. 6, No. 7.
ISSN: 1070-1788.
PB Business Communications Company, Inc
DT Newsletter
LA English
WC 324

L21 ANSWER 24 OF 36 PROMT COPYRIGHT 2002 Gale Group

ACCESSION NUMBER: 1998:355698 PROMT
TITLE: Bright idea
AUTHOR(S): Friedman, Dorian; Hammel, Sara; Atlas, Stacy
SOURCE: U.S. News & World Report, (13 Jul 1998) pp. 12.
ISSN: 0041-5537.
LANGUAGE: English
WORD COUNT: 221
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L21 ANSWER 25 OF 36 PROMT COPYRIGHT 2002 Gale Group

ACCESSION NUMBER: 1998:407870 PROMT
TITLE: Food That Glows in the Dark
SOURCE: Industries In Transition, (1 Jul 1998) pp. N/A.
LANGUAGE: English
WORD COUNT: 324
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L21 ANSWER 26 OF 36 PROMT COPYRIGHT 2002 Gale Group

ACCESSION NUMBER: 1998:391299 PROMT
TITLE: ENZYMES: Food that Glows in the Dark
SOURCE: Food Ingredient News, (1 Jul 1998) pp. N/A.
ISSN: 1070-1788.
LANGUAGE: English
WORD COUNT: 324
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L21 ANSWER 27 OF 36 WPIDS (C) 2002 THOMSON DERWENT

TI Glow-in-the-dark fluid for squirt **gun**, wand and fountain -
comprises population of mechanical stress-stimulated
bioluminescence organisms such as Pyrocistis species in fluid
suspension.
PI US 5730321 A 19980324 (199819)* 9p G01F011-00
IN FRANGOS, J; LATZ, M; MCALLISTER, T

L21 ANSWER 28 OF 36 CEN COPYRIGHT 2002 ACS

AN 1998:1820 CEN
TI Young company aims at **bioluminescent** novelties
AU Reese, K.M.
SO Chemical & Engineering News, (29 Jun 1998) Vol. 76, No. 26, pp. 96.
CODEN: CENEAR, ISSN: 0009-2347.
PB American Chemical Society
LA English
WC 289

L21 ANSWER 29 OF 36 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI
TI Use of **bioluminescence** generating systems;
transgenic fish construction by luciferase gene expression
AU Bryan B J
AN 1997-11332 BIOTECHDS
PI WO 9729319 14 Aug 1997

L21 ANSWER 30 OF 36 COPYRIGHT 2002 Gale Group

AN 95:63707 NLDB
TI Need FDA Regulatory Help?
SO Biomedical Market Newsletter, (Jun 1995) Vol. 5, No. 6.
ISSN: 1064-4180.
PB Biomedical Market Newsletter, Inc
DT Newsletter
LA English
WC 2679

L21 ANSWER 31 OF 36 NTIS COPYRIGHT 2002 NTIS
TI Rapid Field Toxicity Test for Water Supplies. Phase 1. (Final rept. 16
Feb-15 Aug 93.)
NR AD-B178 328/1/XAB
25 p. NTIS Prices: PC A03/MF A01
Availability: Approved for Public Release; Distribution Unlimited. Product
reproduced from digital image. Order this product from NTIS by: phone at
1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at
(703)321-8547; and email at orders.ntis.fedworld.gov. NTIS is located at
5285 Port Royal Road, Springfield, VA, 22161, USA.
PD 15 Aug 1993
AU Sabate, R. W.; Dewailly, E. L.; Stiffey, A. V.
AN 1997(24):963 NTIS

L21 ANSWER 32 OF 36 PROMT COPYRIGHT 2002 Gale Group

ACCESSION NUMBER: 91:517408 PROMT
TITLE: **Toyo** Ink to Launch Kit for Checking Gene
Expression by Luciferase Assay
SOURCE: Comline Biotechnology & Medical, (4 Oct 1991) pp. 4.
LANGUAGE: English
WORD COUNT: 217
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L21 ANSWER 33 OF 36 BIOCOMMERCE COPYRIGHT 2002 BioCommerce Data Ltd.
AN 0172594 BIOCOMMERCE FS Abstract
CO Prolume (46659), USA
SO Newsweek, 13 JUL 1998, Page(s) 8.
TC (Company information)

L21 ANSWER 34 OF 36 BIOCOMMERCE COPYRIGHT 2002 BioCommerce Data Ltd.
AN 0056992 BIOCOMMERCE FS Abstract
CO Promega Corp (11778), USA
Toyo Ink Manufacturing Co Ltd (25059), Japan
SO AgBiotechnology News, JUL 1991, vol. 84, Page(s) 11,22.
TC (Company information)

L21 ANSWER 35 OF 36 FROSTI COPYRIGHT 2002 LFRA
AN 444949 FROSTI
TI **Bioluminescent novelty items.**

IN Bryan B.J.
SO PCT Patent Application
PI WO 9729319 A1
AI 19970203
PRAI United States 19960206; 19961125
DT Patent
LA English
SL English

L21 ANSWER 36 OF 36 FROSTI COPYRIGHT 2002 LFRA
AN 487624 FROSTI
TI **Bioluminescent novelty items.**
IN Bryan B.J.
SO European Patent Application
PI EP 879383 A2
WO 9729319 19970814
AI 19970203
PRAI United States 19960206; 19961125
DT Patent
LA English
SL English

=> d all 14,15,21

L21 ANSWER 14 OF 36 SCISEARCH COPYRIGHT 2002 ISI (R)
AN 2000:125776 SCISEARCH
GA The Genuine Article (R) Number: 282FE
TI Prolume aglow with its genetic entertainment - **Toys** lead the way
to **bioluminescent** therapeutics and diagnostics
AU Potera C
SO GENETIC ENGINEERING NEWS, (1 FEB 2000) Vol. 20, No. 3, pp. 37-&.
Publisher: MARY ANN LIEBERT INC PUBL, 2 MADISON AVENUE, LARCHMONT, NY
10538.
ISSN: 0270-6377.
DT Article; Journal
LA English
REC Reference Count: 0
CC BIOTECHNOLOGY & APPLIED MICROBIOLOGY; GENETICS & HEREDITY

L21 ANSWER 15 OF 36 CBNB COPYRIGHT 2002 EI
AN 16(5):6836 CBNB
TI New meaning for gene **gun** in **toy** glow-in-dark water
pistol.
SO Biotechnology Newswatch (17 Jan 2000), 1,6-7, (200-899 words)
ISSN: 0275-3685
DT Journal
LA English
PY 2000
AB In order to raise capital to fund its cancer research, US company Prolume
produced the world's 1st biotechnology **toy**, a water pistol
which fires a glow-in-the dark liquid. Over the Christmas period Prolume
sold 2000 water pistols at \$5 /each. The liquid they contain is produced
by cloning luminescence genes from sea creatures and combining them with
a bacteria that produces protein. This patented technology can be used
for a vast range of applications from cosmetics to signposts. In China
luminous make-up is already being manufactured. Prolume itself is
developing a new and improved version of its water pistol and is working
on brewing beer which glows green for St Patrick's Day. However the

company's real interest lies in medical applications of the technology. One idea is to make a luminescent product that selectively migrates to tumour tissue. Prolume has built up a library of 25 different types of sea creatures which glow and has identified the luminescent genes in 3. The US National Institutes of Health awarded the company's Nanolight Division a \$298,000 Small Business Innovation Research grant recently and further larger grants could follow if the technology proves successful. Prolume has applied for patents on the **bioluminescent** proteins (Luciferases and Green Fluorescent Proteins).

CC MS-21; MS-04
Biotechnology; Pharmaceuticals, Prosthetics, and Medical Chemistry
CO Prolume
GT 2101: USA
CT sales; research and development; patents and technical know-how; company structure
CN biotechnology products
SIC 2836 Biological Products

L21 ANSWER 21 OF 36 COPYRIGHT 2002 Gale Group DUPLICATE 7

AN 1999:48043 NLDB
TI **Bioluminescence** is marketing's newest rising star.
SO About Women & Marketing, (19 Dec 1998) Vol. 11, No. 12.
PB About Women, Inc.
DT Newsletter
LA English
WC 90

TX A radioactive-looking greenish tinge may be one of the latest looks for **toys**, cosmetics and even food. The biotech firm Prolume has created NanoLight." This eerie green glow occurs naturally in certain types of marine animals, and Prolume's researchers have been able to design an artificial version of the protein which causes it. "Nanolight" still awaits FDA approval for use in food, but it will be introduced in a **toy** called Alien Crystals, due out by the year's end. Source: U.S. News & World Report, Washington, DC, July 13, 1998

THIS IS THE FULL TEXT: COPYRIGHT 1998 Marketing to Women, Inc.

Subscription: Published monthly. Contact About Women, Inc., 33 Broad St., Boston, MA 02109. Phone (617) 723-4337. FAX (617) 623-7107.

CT ADV Advertising, Marketing and Public Relations; BUSN Any type of business

=> log y

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
106.24	126.40

FULL ESTIMATED COST

STN INTERNATIONAL LOGOFF AT 16:04:55 ON 08 MAY 2002

	L #	Hits	Search Text	DBs	Time Stamp
1	L1	9471	biolumines\$ or fluorescen\$ near4 protein\$1 or luciferase\$1 or photoprotein\$1	USPAT; US-PGPUB	2002/05/08 12:44
2	L2	2157	gun near5 (toy or squirt or water)	USPAT; US-PGPUB	2002/05/08 12:44
3	L3	8	1 and 2	USPAT; US-PGPUB	2002/05/08 12:44
4	L4	53179	chemilumines\$ or lumines\$8 or glow\$8	USPAT; US-PGPUB	2002/05/08 12:45
5	L5	58	(4 and 2) not 1	USPAT; US-PGPUB	2002/05/08 12:45
6	L6	62616	toy or novelty	USPAT; US-PGPUB	2002/05/08 12:46
7	L7	112	6 and 1	USPAT; US-PGPUB	2002/05/08 12:46
8	L8	11	6 same 1	USPAT; US-PGPUB	2002/05/08 12:46
9	L9	5	8 not 3	USPAT; US-PGPUB	2002/05/08 12:46
10	L10	13	1 and toy	USPAT; US-PGPUB	2002/05/08 12:46
11	L11	6	10 not 3	USPAT; US-PGPUB	2002/05/08 12:46
12	L12	16	1 and novelty adj item\$1	USPAT; US-PGPUB	2002/05/08 12:47
13	L13	10	12 not 3	USPAT; US-PGPUB	2002/05/08 12:47

	L #	Hits	Search Text	DBs	Time Stamp
1	L1	9471	biolumines\$ or fluorescen\$ near4 protein\$1 or luciferase\$1 or photoprotein\$1	USPAT; US-PGPU	2002/05/08 11:16
2	L2	2157	gun near5 (toy or squirt or water)	USPAT; US-PGPU	2002/05/08 11:17
3	L3	8	1 and 2	USPAT; US-PGPU	2002/05/08 11:17

PGPUB-DOCUMENT-NUMBER: 20020016980
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020016980 A1

TITLE: Transgenic plants incorporating traits of zosteria marina

PUBLICATION-DATE: February 7, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Alberte, Randall S.	Falmouth	ME	US	
Smith, Robert	Falmouth	ME	US	

US-CL-CURRENT: 800/289,536/23.6 ,800/278

ABSTRACT:

The invention provides methods and compositions related to transgenic plants which incorporate genetic traits of the marine eelgrass *Zostera marina*. These traits include pathogen resistance, which may be conferred by stimulating zosteric acid biosynthesis, and root anoxia resistance, which may be conferred by introducing one or more anoxia-induced or anoxia-resistance genes.

DATE FILED: May 10, 2001

----- KWIC -----

DETX:

[0075] The term "marker" or "marker sequence" or similar phrase means any gene that produces a selectable genotype or preferably a selectable phenotype. It includes such examples as the neo gene, green **fluorescent protein** (GFP) gene, TK gene, b-galactosidase gene, etc. The marker sequence may be any sequence known to those skilled in the art that serves these purposes, although typically the marker sequence will be a sequence encoding a protein that confers a selectable trait, such as an antibiotic resistance gene, or an enzyme that can be detected and that is not typically found in the cell. The marker sequence may also include regulatory regions such as a promoter or enhancer that regulates the expression of that protein. However, it is also possible to transcribe the marker using endogenous regulatory sequences. In one embodiment of the present invention, the marker facilitates separation of transfected from untransfected cells by fluorescence activated cell sorting, for example by the use of a fluorescently labeled antibody or the expression of a **fluorescent protein** such as GFP. Other DNA sequences that facilitate expression of marker genes may also be incorporated into the DNA constructs of the present invention. These sequences include, but are not limited to transcription initiation and termination signals, translation signals, post-translational

modification signals, intron splicing junctions, ribosome binding sites, and polyadenylation signals, to name a few. The marker sequence may also be used to append sequence to the target gene. For example, it may be used to add a stop codon to truncate IL-1RN translation. The use of selectable markers is well known in the art and need not be detailed herein. The term "modulation" as used herein refers to both upregulation (i.e., activation or stimulation (e.g., by agonizing or potentiating)) and downregulation (i.e. inhibition or suppression (e.g., by antagonizing, decreasing or inhibiting)).

DETX:

[0179] In addition, the recombinant constructs may include plant-expressible selectable or screenable marker genes for isolating, identifying or tracking of plant cells transformed by these constructs. Selectable markers include, but are not limited to, genes that confer antibiotic resistances (e.g., resistance to kanamycin or hygromycin) or herbicide resistance (e.g., resistance to sulfonylurea, phosphinothricin, or glyphosate). Screenable markers include, but are not limited to, the genes encoding beta-glucuronidase (Jefferson, 1987, Plant Molec Biol. Rep 5:387-405), luciferase (Ow et al., 1986, Science 234:856-859), B and C1 gene products that regulate anthocyanin pigment production (Goffet al., 1990, EMBO J 9:2517-2522).

DETX:

[0208] The particle gun may utilize a macrocarrier, which supports or carries the particles and is accelerated along with the particles towards the target. The macrocarrier is usually retained by a stopping plate or screen before it collides with the target, whereas the particles continue along their course. In most cases, the particles are accelerated under partial vacuum in a vacuum chamber to reduce air drag. Particle penetration is controlled by modifying the intensity of the explosive burst, by changing the distance that the particles must travel to reach the target tissue or by using different sized particles. A commercial hand-held device (the Helios Gene Gun) is available from BioRad Laboratories (Hercules, Calif.). A helium-modified bombardment device, which utilizes continual build-up of helium back-pressure delivered to a calibrated rupture disc which transmits a shock wave to a second disc or macrocarrier that holds the DNA-coated particles, is also available from BioRad (i.e. the PDS-1000/He unit). A high voltage electrical discharge gun which causes rapid vaporization of a water droplet which in turn transmits a shock wave to a mylar sheet coated with DNA-bound particles has also been developed (see McCabe and Christou (1993) Plant Cell Tiss Organ Cult 33: 227-236). Yet another device for particle bombardment is a microtargeting device, which does not utilize a macrocarrier (Sautter et al. (1991) Bio/Technology 9: 1080-5). This device accelerates small amounts of a DNA/particle mixture in a focused stream of high-pressure nitrogen. The DNA is not precipitate on the gold particles, but is delivered as a mixture.

PGPUB-DOCUMENT-NUMBER: 20020004942
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020004942 A1

TITLE: Bioluminescent novelty items

PUBLICATION-DATE: January 10, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Bryan, Bruce	Beverly Hills	CA	US	

US-CL-CURRENT EEEE: 800/288

ABSTRACT:

Novelty items that are combinations of articles of manufacture with fluorescent proteins are provided. These novelty items, include combinations of transgenic plants that express a luciferase or a luciferin with plant food that contains a luciferase and a luciferin.

US-PAT-NO: 6247995
DOCUMENT-IDENTIFIER: US 6247995 B1

TITLE: Bioluminescent novelty items

DATE-ISSUED: June 19, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bryan; Bruce	Beverly Hills	CA	90210	N/A

US-CL-CURRENT: 446/473,124/74 ,124/76 ,222/1 ,42/54 ,435/189

ABSTRACT:

Systems and apparatus for generating bioluminescence, and combinations of these systems and apparatus with inanimate articles of manufacture to produce novelty items are provided. These novelty items, which are articles of manufacture, are designed for entertainment, recreation and amusement, include, toys, paints, slimy play material, textiles, particularly clothing, bubbles in bubble making toys and other toys that produce bubbles, balloons, personal items, such as bath powders, body lotions, gels, powders and creams, toothpastes and other dentifrices, soaps, body paints, and bubble bath, foods, such as gelatins, icings and frostings, beverages such as beer, wine, champagne, soft drinks, and ice cubes, fountains, including liquid "fireworks" and other such jets or sprays or aerosols of compositions that are solutions, mixtures, suspensions, powders, pastes, particles or other suitable formulation.

70 Claims, 19 Drawing figures
Exemplary Claim Number: 1,23
Number of Drawing Sheets: 5

US-PAT-NO: 6232107

DOCUMENT-IDENTIFIER: US 6232107 B1

TITLE: Luciferases, fluorescent proteins, nucleic acids encoding the luciferases and fluorescent proteins and the use thereof in diagnostics, high throughput screening and novelty items

DATE-ISSUED: May 15, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bryan; Bruce J.	Beverly Hills	CA	90210	N/A
Szent-Gyorgyi; Christopher	Pittsburgh	PA	N/A	N/A

US-CL-CURRENT: 435/189,435/183 ,435/252.2 ,435/320.1 ,435/6 ,435/69.1 ,435/8

ABSTRACT:

Isolated and purified nucleic acid molecules that encode a luciferase from *Renilla mulleri*, *Gaussia* and *Pleuromamma*, and the proteins encoded thereby are provided. Isolated and purified nucleic acids encoding green fluorescent proteins from the genus *Renilla* and *Ptilosarcus*, and the green fluorescent proteins encoded thereby are also provided. Compositions and combinations comprising the green fluorescent proteins and/or the luciferase are further provided.

63 Claims, 14 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 11

US-PAT-NO: 6152358
DOCUMENT-IDENTIFIER: US 6152358 A

TITLE: Bioluminescent novelty items

DATE-ISSUED: November 28, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bryan; Bruce	Beverly Hills	CA	90210	N/A

US-CL-CURRENT: 229/87.19,435/189 ,493/955

ABSTRACT:

Novelty items that are combinations of articles of manufacture with bioluminescence generating systems and/or fluorescent proteins are provided. These novelty items, which are articles of manufacture, are designed for entertainment, recreation and amusement, and include toys, paints, slimy play material, textiles, particularly clothing, bubbles in bubble making toys and other toys that produce bubbles, balloons, personal items, such as cosmetics, bath powders, body lotions, gels, powders and creams, toothpastes and other dentifrices, soaps, body paints, and bubble bath, foods, such as gelatins, icings and frostings, beverages such as beer, wine, champagne, soft drinks, and glowing ice, fountains, including liquid "fireworks" and other such jets or sprays or aerosols of compositions that are solutions, mixtures, suspensions, powders, pastes, particles or other suitable formulation.

58 Claims, 34 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 9

US-PAT-NO: 6113886
DOCUMENT-IDENTIFIER: US 6113886 A

TITLE: Bioluminescent novelty items

DATE-ISSUED: September 5, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bryan; Bruce	Beverly Hills	CA	90210	N/A

US-CL-CURRENT: 424/49,424/63 ,424/64 ,424/69 ,424/70.1 ,424/70.6 ,424/70.7
,424/78.02 ,424/94.4 ,435/189 ,510/119 ,510/135 ,510/392 ,510/481

ABSTRACT:

Novelty items that are combinations of articles of manufacture with bioluminescence generating systems and/or fluorescent proteins are provided. These novelty items, which are articles of manufacture, are designed for entertainment, recreation and amusement, and include toys, personal items, such as cosmetics, bath powders, body lotions, gels, powders and creams, toothpastes and other dentifrices, soaps, body paints, and bubble bath, fountains, including liquid "fireworks" and other such jets or sprays or aerosols of compositions that are solutions, mixtures, suspensions, powders, pastes, particles or other formulations.

30 Claims, 34 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 9

US-PAT-NO: 5876995
DOCUMENT-IDENTIFIER: US 5876995 A

TITLE: Bioluminescent novelty items

DATE-ISSUED: March 2, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bryan; Bruce	Beverly Hills	CA	90210	N/A

US-CL-CURRENT: 435/189,426/104 ,426/250 ,426/262 ,426/268 ,426/383 ,426/422
,426/540 ,426/590 ,426/592 ,426/656 ,426/66 ,530/350

ABSTRACT:

Systems and apparatus for generating bioluminescence, and combinations of these systems and apparatus with inanimate articles of manufacture to produce novelty items are provided. These novelty items, which are articles of manufacture, are designed for entertainment, recreation and amusement, and include toys, paints, slimy play material, textiles, particularly clothing, bubbles in bubble making toys and other toys that produce bubbles, balloons, personal items, such as bath powders, body lotions, gels, powders and creams, toothpastes and other dentifrices, soaps, body paints, and bubble bath, foods, such as gelatins, icings and frostings, beverages such as beer, wine, champagne, soft drinks, and glowing ice, fountains, including liquid "fireworks" and other such jets or sprays or aerosols of compositions that are solutions, mixtures, suspensions, powders, pastes, particles or other suitable formulation. Cartridges for charging and/or recharging the novelty items with bioluminescence generating systems are also provided.

47 Claims, 34 Drawing figures
Exemplary Claim Number: 25
Number of Drawing Sheets: 9

US-PAT-NO: 5730321

DOCUMENT-IDENTIFIER: US 5730321 A

TITLE: Glow-in-the-dark water emitters

DATE-ISSUED: March 24, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
McAllister; Todd	Encinitas	CA	92024	N/A
Frangos; John	Del Mar	CA	92014	N/A
Latz; Michael	San Diego	CA	92130	N/A

US-CL-CURRENT: 222/1,222/394 ,222/79

ABSTRACT:

The invention relates to methods, compositions and apparatuses, such as squirt guns and of the water emitting devices, that eject a flow of aqueous fluid having visible **bioluminescence**, providing "glow-in-the dark" emissions. The devices contain a population of a mechanical stress-stimulatable **bioluminescent** organisms, such as Pyrocystis species such as lunula and fusiformis, in suspension in a fluid. The fluid luminesces when ejected from an aperture of the device. The devices may also include a fluid flow generator, such as a mechanical pump, capable of inducing the flow of the fluid through the flow path and a trigger or valve capable of activating said fluid flow generator. In addition, the invention provides containers for viably storing populations of the **bioluminescent** organisms, methods and media for culturing and diluting the organisms, and kits of an emitter, a storage apparatus, suitable **bioluminescent** organisms, and culture media. The storage apparatuses may include a time-cycled light source capable of periodically illuminating the organisms and a solid or semisolid nutrient medium capable of supporting their viability and growth.

13 Claims, 5 Drawing figures

Exemplary Claim Number: 1,7

Number of Drawing Sheets: 5

DATE FILED: December 13, 1995

----- KWIC -----

ABPL:

The invention relates to methods, compositions and apparatuses, such as squirt guns and of the water emitting devices, that eject a flow of aqueous fluid having visible **bioluminescence**, providing "glow-in-the dark" emissions. The devices contain a population of a mechanical stress-stimulatable **bioluminescent** organisms, such as Pyrocystis species such as lunula and fusiformis, in suspension in a fluid. The fluid luminesces when ejected from an aperture of the device. The devices may also include a fluid flow generator, such as a mechanical pump, capable of inducing the flow of the fluid through the flow path and a trigger or valve capable of activating said fluid flow generator. In addition, the invention provides containers for viably storing populations of the **bioluminescent** organisms, methods and media for culturing and diluting

the organisms, and kits of an emitter, a storage apparatus, suitable **bioluminescent** organisms, and culture media. The storage apparatuses may include a time-cycled light source capable of periodically illuminating the organisms and a solid or semisolid nutrient medium capable of supporting their viability and growth.

BSPR:

Apparatuses for various scientific analyses relating to **bioluminescence** are described in U.S. Pat. Nos. 5,112,646; 5,141,869; 5,264,906; and 4,863,690. Latz et al. (1994) Limnol. Oceanogr. 39: 1424-1439 report on the excitation of **bioluminescence** by laminar fluid shear associated with simple Couette flow.

BSPR:

In one embodiment, the apparatuses comprise a housing at least partially defining a fluid flow path which includes means for obstructing fluid flow, such as a fluid flow-restricting aperture. The housing is generally pressurizeable to induce the flow of the fluid along the flow path and through the aperture. The housing contains a fluid medium such as a buffered saline which comprises a population of one or more isolated mechanical stress-stimulatable **bioluminescent** organisms. The population is of size, concentration, activity, etc. such that it is capable of emitting mechanical stress-stimulated **bioluminescence** visible to an unaided human eye. A number of prokaryotic and eukaryotic microorganisms find use in the subject method, including Pyrocystis species such as lunula and fusiformis. In operation, a productive flow of the fluid through the flow path is capable of subjecting the population to a mechanical stress sufficient to stimulate **bioluminescence** of the population visible to the unaided human eye. Frequently, the apparatuses additionally comprise a fluid flow generator, such as a mechanical pump, capable of inducing the flow of the fluid through the flow path and a trigger or valve capable of activating said fluid flow generator.

BSPR:

The invention also provides apparatuses for viably storing populations of the **bioluminescent** organisms for use in the subject methods and emitters, methods and media for culturing and diluting the organisms, and kits comprising combinations of an emitter, a storage apparatus, suitable **bioluminescent** organisms, and media and/or media concentrate. The storage apparatuses may include a time-cycled light source capable of periodically illuminating the organisms and/or a solid or semisolid nutrient medium capable of supporting their viability and/or growth.

DRPR:

FIG. 1 **Squirt gun** with mechanical-stress dampening baffles.

DEPR:

The invention provides methods and compositions relating to apparatuses for generating a **bioluminescent** fluid. The subject methods and compositions find a wide variety of aesthetic and industrial applications where an emitted stream of a mechanically-stimulatable **bioluminescence** is desired. Some examples include fountains or pools, festival water effects, water-powered rocket launchers, eco-friendly "fireworks". Industrial applications include any application where a night-visible targeting tracer is desired, e.g. night time

forest fire water dumps.

DEPR:

In one embodiment, the subject emitters comprise a housing at least partially defining a fluid flow path. The nature of the housing is dictated largely by the application. In any event, the housing should be compatible with the selected **bioluminescent** microorganisms, e.g. should not provide acute toxicity, and generally provides a light shielding reservoir to contain the microorganisms prior to ejection or emission from the housing. Exemplary housings include or comprise squirt guns and other stream emitters such as fountains and hoses; spray emitters such as spray bottles and cans, mist-making valves, nozzles, etc.

DEPR:

The housing provides means for obstructing fluid flow, which, in conjunction with the fluid flow, provides the microorganism population interacting with it, e.g. passing around, by or through the obstacle, with mechanical stress or strain sufficient to stimulate the population to the requisite **bioluminescence**. Exemplary obstacles include a fluid flow-restricting tube or aperture venting the housing to atmospheric pressure, a baffle, etc. A flow that stimulates **bioluminescence** capable of detection by an unaided human eye is referred to as a productive flow. As used herein, visible to an unaided human eye means capable of being detected by an unaided human eye under optimal conditions, e.g. darkness.

DEPR:

The housing contains a fluid medium such as a buffered saline which comprises a population of an isolated mechanical stress-stimulatable **bioluminescent** organism. The contained fluid is aqueous and supports the physiology of the selected luminescent organism at least to the extent necessary to support the requisite mechanical stress-stimulatable **bioluminescence**. As such, the fluid generally comprises nutrients sufficient to support the physiology of the selected luminescent organism at least to the extent necessary to support the requisite mechanical stress-stimulatable **bioluminescence**. The population is of size, concentration, activity, etc. such that it is capable, in the targeted application, of emitting mechanical stress-stimulated **bioluminescence** visible to an unaided human eye. Generally, the cells are concentrated to at least three times, preferably at least ten times, more preferably at least 100 times, most preferably at least 1,000 times greater than found in natural, free populations. While cells may be concentrated from natural sources, they are preferably grown in in vitro culture. Concentrations are preferably achieved by membrane filtration. In any event, it is important to avoid co-concentrating toxic contaminants or raising the salinity or ionic strength beyond levels compatible with the requisite physiology of the organisms.

DEPR:

The choice of stress-stimulatable microorganism is dictated by the targeted application and convenience, such as rigor, e.g. temperature, fluid media, light and stress tolerances, growth requirements and rate, light wavelength/intensity/longevity, threshold sensitivity, cost, availability, etc. Preferred species can live in a variety of environments while their **bioluminescence** is dependent on a photosynthetic process. For many

applications, preferred cells luminesce optimally on a circadian rhythm of 12 hours light/12 hours dark and it is possible to maintain their circadian rhythm and ability to luminesce on an a few, e.g. as little as one, two or three, hours of light per day. Furthermore, if the cycle is broken for a prolonged period (e.g. days), preferred cells will regain their normal luminescent properties after a few 24 hour light/dark cycles. Preferred cells may be cultured in simple media such as enriched sterile seawater and/or the solid agar media, such as those disclosed herein. In addition to shear stress sensitivity, preferred cells can be engineered to luminesce at a particular point in a fluid stream. Furthermore, natural signal decay and refractory periods can be utilized to generate desired effects. For example, perturbations to the flow may be introduced upstream of the exit aperture such that the housing and the flow path are also illuminated. Because of the finite decay time of the luminescence, the stream would still be visible after exiting the aperture. Conversely, the flow path and exit aperture can be designed such that the mechanical stimulation is minimized. In this case, the luminescence is delayed until either the stream impacts a solid surface or the flow encounters sufficient air drag to trigger the cells.

DEPR:

A number of natural dinoflagellates and dinoflagellate-like marine microorganisms, including *Protoperdinium*, *Noctiluca*, *Polykrikos*, *Gonyaulax*, *Ceratium*, and particularly, *Pyrocystis* species such as *lunula* and *fusiformis*, have proven exceptionally well suited to the subject methods and devices, particularly in applications which preclude the use of potentially pathogenic or otherwise toxic microorganisms. In addition, a variety of microorganisms such as *E. coli* may be transformed with genes encoding proteins which effect bioluminescence and those transformants with mechanical stress-responsive bioluminescence selected, conveniently with automated fluorescence activated cell sorters (FACS).

DEPR:

The invention also provides apparatuses for viably storing populations of the bioluminescent organisms for use in the subject methods and emitters, methods and media for culturing and diluting the organisms, and kits comprising combinations of an emitter, a storage apparatus, suitable bioluminescent organisms, and media and/or media concentrate. The storage apparatuses are provided in several configurations. They may include a translucent cartridge or cartridge containing a time-cycled light source capable of periodically illuminating the organisms and/or a solid or semisolid nutrient medium capable of supporting their viability and/or growth. In one embodiment, the storage apparatus is a sealed and sterile liquid container with a transparent or translucent exterior housing. A hydrophobic filter which supports required gas exchange while maintaining a sterile environment. Alternatively, a cartridge having a light-opaque housing may be used. Such cartridges are fitted with an internal light source and timing device capable of maintaining the bioluminescent rhythm of the organisms. The storage cartridges can accommodate semi-solid or solid agar bound cells, e.g. shaped as a coil or pleated sheet, to maximize the light-exposed surface to volume ratio.

DEPR:

FIG. 1 shows a squirt gun 1 for use in the subject invention. The fluid

comprising the **bioluminescent** organisms is added through a fluid inlet 2 into a mechanical dampening bladder 3 further containing a baffle system 4 to minimize stimulation prior to emission. The bladder 3 is contained within a rigid reservoir housing 5, which is pressurized by a pressurized gas chamber 6. A trigger 7 operates a valve 8 which connects the bladder 3 to a tube 9 which carries the fluid from the bladder 3 to the exit aperture 10.

DEPR:

FIGS. 2 shows a "magic wand" 20 for use in the subject invention. The fluid comprising the **bioluminescent** organisms is added through a fluid inlet 21 into a fluid reservoir 22. A trigger 23 operates a valve 24 which connects a pressurized chamber 25 to the reservoir 22. Activating the trigger 23 opens the valve 24 causing the fluid in the reservoir 22 to move through a tube 26 which carries the fluid to the exit aperture 27. The exit aperture is designed such that the fluid is vaporized at the exit, creating a luminescent mist surrounding the tip of the wand.

CLPR:

4. An apparatus for generating a luminescent fluid, said apparatus comprising: a pressurizable housing at least partially defining a fluid flow path comprising means for obstructing fluid flow and containing a fluid, said fluid comprising a population of an isolated mechanical stress-stimulatable **bioluminescent** organism, said population capable of emitting mechanical stress-stimulated **bioluminescence** visible to an unaided human eye, wherein said obstructing means is capable of subjecting said population to a mechanical stress sufficient to stimulate **bioluminescence** of said population visible to said unaided human eye when said fluid moves through said flow path wherein said apparatus is a **squirt gun**, a fountain, or a wand.

CLPR:

7. A method for generating a luminescent fluid, said method comprising the step of moving a fluid comprising a population of an isolated mechanical stress-stimulatable **bioluminescent** organism, said population capable of emitting mechanical-stimulated **bioluminescence** visible to an unaided human eye, from a first pressurized region through a fluid flow path comprising an aperture to a second region at atmospheric pressure whereby said population is subject to a mechanical stress sufficient to stimulate **bioluminescence** of said population visible to said unaided human eye.

CLPR:

11. A kit according to claim 10 wherein said second apparatus comprises a time-cycled light source capable of periodically illuminating said population of an isolated mechanical stress-stimulatable **bioluminescent** organism.

CLPR:

12. A kit according to claim 10, wherein said second apparatus comprises a solid or semisolid nutrient medium capable of supporting the viability of said population of an isolated mechanical stress-stimulatable **bioluminescent** organism.

CLPR:

13. A kit according to claim 10, wherein said first apparatus is a **squirt gun**.

a fountain, or a wand.

CLPV:

a pressurizeable housing at least partially defining a fluid flow path comprising an aperture capable of venting said housing to atmospheric pressure, and containing a fluid, said fluid comprising a population of an isolated mechanical stress-stimulatable bioluminescent organism, said population capable of emitting mechanical stress-stimulated bioluminescence visible to an unaided human eye, wherein a productive flow of said fluid through said flow path is capable of subjecting said population to a mechanical stress sufficient to stimulate bioluminescence of said population visible to said unaided human eye wherein said apparatus is a squirt gun, a fountain, or a wand.

CLPV:

(a) a first apparatus for generating a luminescent fluid, said apparatus comprising a housing at least partially defining a fluid flow path comprising an aperture capable of venting said housing to atmospheric pressure, and capable of containing a fluid, said fluid comprising a population of an isolated mechanical stress-stimulatable bioluminescent organism, said population capable of emitting mechanical stress-stimulated bioluminescence visible to an unaided human eye, wherein a productive flow of said fluid through said flow path is capable of subjecting said population to a mechanical stress sufficient to stimulate bioluminescence of said population visible to said unaided human eye;

CLPV:

(b) a second apparatus for viably storing said population of an isolated mechanical stress-stimulatable bioluminescent organism.

ORPL:

Latz et al. (1994) Excitation of bioluminescence by laminar fluid shear associated with simple Couette flow. Limnol. Oceanogr 39, 1424-1439.

	L #	Hits	Search Text	DBs	Time Stamp
1	L1	9471	biolumines\$ or fluorescen\$ near4 protein\$1 or luciferase\$1 or photoprotein\$1	USPAT; US-PGPU	2002/05/08 11:16
2	L2	2157	gun near5 (toy or squirt or water)	USPAT; US-PGPU	2002/05/08 11:17
3	L3	8	1 and 2	USPAT; US-PGPU	2002/05/08 11:17
4	L4	53179	chemilumines\$ or lumines\$8 or glow\$8	USPAT; US-PGPU	2002/05/08 11:44
5	L5	58	(4 and 2) not 1	USPAT; US-PGPU	2002/05/08 11:44

PGPUB-DOCUMENT-NUMBER: 20020048169
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020048169 A1

TITLE: Light-emitting diode based products

PUBLICATION-DATE: April 25, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Dowling, Kevin J.	Westford	MA	US	
Morgan, Frederick M.	Quincy	MA	US	
Lys, Ihor A.	Boston	MA	US	
Blackwell, Michael K.	Milton	MA	US	
Ducharme, Alfred	Tewksbury	MA	US	
Osterhout, Ralph	San Francisco	CA	US	
Piepgas, Colin	Salem	MA	US	
Mueller, George G.	Boston	MA	US	
Geary, Dawn	Southborough	MA	US	

US-CL-CURRENT: 362/234,372/38.1 ,396/106

ABSTRACT:

High-brightness LEDs, combined with a processor for control, can produce a variety of pleasing effects for display and illumination. A system disclosed herein uses high-brightness, processor-controlled LEDs in combination with diffuse materials to produce color-changing effects. The systems described herein may be usefully employed to bring autonomous color-changing ability and effects to a variety of consumer products and other household items. The system may also include sensors so that the illumination of the LEDs might change in response to environmental conditions or a user input. Additionally, the system may include an interface to a network, so that the illumination of the LEDs may be controlled via the network.

DATE FILED: March 13, 2001

----- KWIC -----

BSTX:

[0003] For example, many toys, such as balls, may benefit from improved color illumination, processing, and/or networking attributes. There are toy balls that have lighted parts or balls where the entire surface appears to glow, however there is no ball available that employs dynamic color changing effects. Moreover, there is no ball available that responds to data signals provided from a remote source. As another example, ornamental devices are often lit to

provide enhanced decorative effects. U.S. Pat. Nos. 6,086,222 and 5,975,717, for example, disclose lighted ornamental icicles with cascading lighted effects. As a significant disadvantage, these systems employ complicated wiring harnesses to achieve dynamic lighting. Other examples of crude dynamic lighting may be found in consumer products ranging from consumer electronics to home illumination (such as night lights) to toys to clothing, and so on.

DRTX:

[0009] FIG. 3 shows a glow stick according to the principles of the invention;

DETX:

[0035] As used herein, the term "LED" means any system that is capable of receiving an electrical signal and producing a color of light in response to the signal. Thus, the term "LED" should be understood to include light emitting diodes of all types, light emitting polymers, semiconductor dies that produce light in response to current, organic LEDs, electro-luminescent strips, silicon based structures that emit light, and other such systems. In an embodiment, an "LED" may refer to a single light emitting diode package having multiple semiconductor dies that are individually controlled. It should also be understood that the term "LED" does not restrict the package type of the LED. The term "LED" includes packaged LEDs, non-packaged LEDs, surface mount LEDs, chip on board LEDs and LEDs of all other configurations. The term "LED" also includes LEDs packaged or associated with phosphor wherein the phosphor may convert energy from the LED to a different wavelength.

DETX:

[0036] An LED system is one type of illumination source. As used herein "illumination source" should be understood to include all illumination sources, including LED systems, as well as incandescent sources, including filament lamps, pyro-luminescent sources, such as flames, candle-luminescent sources, such as gas mantles and carbon arch radiation sources, as well as photo-luminescent sources, including gaseous discharges, fluorescent sources, phosphorescence sources, lasers, electro-luminescent sources, such as electro-luminescent lamps, light emitting diodes, and cathode luminescent sources using electronic saturation, as well as miscellaneous luminescent sources including galvano-luminescent sources, crystallo-luminescent sources, kine-luminescent sources, thermo-luminescent sources, triboluminescent sources, sonoluminescent sources, and radioluminescent sources. Illumination sources may also include luminescent polymers capable of producing primary colors.

DETX:

[0056] FIG. 3 shows a glow stick according to the principles of the invention. The glow stick 15 may include the components described above with reference to FIG. 1, and may operate according to the techniques described above with reference to FIGS. 2A-2B. The glow stick 15 may be any small, cylindrical device that may hang from a lanyard, string, chain, bracelet, anklet, key chain, or necklace, for example, by a clip 20. The glow stick 15, as with many of the lighting devices described herein, may also be used as a handheld device. The glow stick 15 may operate from a battery 30 within the glow stick 10, such as an A, AA, AAA sized battery, or other battery. The battery 30 may be covered by a detachable portion 35 which hides the battery from view during

normal use. An illumination lens 40 may encase a plurality of LEDs and diffuse color emanating therefrom. The lens 40 may be a light-transmissive material, such as a transparent material, translucent material, semitransparent material, or other material suitable for this application. In general, the light-transmissive material may be any material that receives light emitted from one or more LEDs and displays one or more colors that are a combination of the spectra of the plurality of LEDs. A user interface 45 may be included for providing user input to control operation of the glow stick 15. In the embodiment depicted in FIG. 2, the user interface 45 is a single button, however it will be appreciated that any of the interfaces discussed above may suitably be adapted to the glow stick 10. The user interface 45 may be a switch, button or other device that generates a signal to a processor that controls operation of the glow stick 15.

DETX:

[0057] FIG. 4 shows a key chain according to the principles of the invention. The key chain 50 may include a light-transmissive material 51 enclosing one or more LEDs and a system such as the system of FIG. 1 (not shown), a one-button user interface 52, a clip 53 suitable for connecting to a chain 54, and one or more batteries 55. The key chain 50 may be similar to the glow stick 15 of FIG. 2, although it may be of smaller size. To accommodate the smaller size, more compact batteries 55 may be used. The key chain 50 may operate according to the techniques described above with reference to FIGS. 2A-2B.

DETX:

[0091] As will be appreciated from the foregoing examples, an LED system such as that described in reference to FIGS. 1 & 2A-2B may be adapted to a variety of color-changing toys and games. For example, color-changing effects may be usefully incorporated into many games and toys, including a toy gun, a water gun, a toy car, a top, a gyroscope, a dart board, a bicycle, a bicycle wheel, a skateboard, a train set, an electric racing car track, a pool table, a board game, a hot potato game, a shooting light game, a wand, a toy sword, an action figure, a toy truck, a toy boat, sports apparel and equipment, a glow stick, a kaleidoscope, or magnets. Color-changing effects may also be usefully incorporated into branded toys such as a View Master, a Super Ball, a Lite Brite, a Harry Potter wand, or a Tinkerbell wand.

DETX:

[0099] Color-changing badges and other apparel may have particular effect in certain environments. The badge, for example, can be provided with a translucent, semi-translucent or other material and one or more LEDs can be arranged to provide illumination of the material. In a one embodiment, the badge would contain at least one red, one blue and one green LED and the LEDs would be arranged to edge light the material. The material may have a pattern such that the pattern reflects the light. The pattern may be etched into the material such that the pattern reflects the light traveling through the material and the pattern appears to glow. When the three colors of LEDs are provided, many color changing effects can be created. This may create an eye-catching effect and can bring attention to a person wearing the badge, a useful attention-getter in a retail environment, at a trade show, when selling goods or services, or in any other situation where drawing attention to one's self may be useful.

PGPUB-DOCUMENT-NUMBER: 20020020712
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020020712 A1

TITLE: Water gun amusement device

PUBLICATION-DATE: February 21, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hornsby, James R.	St. Louis	MO	US	
Wolfinbarger, Ryan A.	Maplewood	MO	US	
McGowan, Joseph L.	St. Charles	MO	US	
Stuemke, Chad P.	St. Louis	MO	US	
Benson, Marcellus R.	Chesterfield	MO	US	
Midgett, David B.	Sulphur Springs	MO	US	
Ulmer, Kurt V.	St. Louis	MO	US	

US-CL-CURRENT: 222/79,222/113 ,222/192

ABSTRACT:

The present invention provides a toy water gun including a pump for pressurizing the gun for shooting out a stream of water, a trigger for controlling the flow of the water, and a source of electricity and at least one light source for illuminating the stream, wherein the device is adapted to provide a lighted coherent stream of water.

DATE FILED: May 31, 2001

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TTL:

Water gun amusement device

ABTX:

The present invention provides a toy water gun including a pump for pressurizing the gun for shooting out a stream of water, a trigger for controlling the flow of the water, and a source of electricity and at least one light source for illuminating the stream, wherein the device is adapted to provide a lighted coherent stream of water.

BSTX:

[0002] The present invention relates to amusement devices and, more particularly, to an amusement device in the general form of a water gun toy such as those commonly referred to as "squirt guns."

BSTX:

[0005] In one embodiment, the present invention provides an amusement device in the general form of a water gun toy such as those commonly referred to as squirt guns, wherein, in use, the toy produces a lighted coherent "shot" or stream of liquid.

BSTX:

[0006] In one embodiment, the present invention provides a squirt gun for shooting a stream or burst of liquid, wherein the gun comprises a generally elongated housing having a front end, a rear end, an internal chamber for containing a liquid and a portion for containing a source of electricity, a conduit connected to the chamber and to a nozzle at the front end, a pump for pressurizing the chamber for forcing a stream of liquid through the conduit and out of the nozzle, valve structures suitable for controlling the flow of liquid, including for making the stream of liquid coherent, at least one light source adjacent to the front end for illuminating a stream of liquid, means for coupling and operating the means for illuminating and the source of electricity, and a trigger mechanism connected to the housing for actuating a stream of liquid.

BSTX:

[0007] In one embodiment, a "smaller" water gun design comprises a housing defining a barrel, a water chamber within the housing, an orifice with a removable quick fill cap allowing access to the water chamber, a handle with a trigger, a coherent flow nozzle, and a double stroke pump. The water chamber is hollow and, in some embodiments, the quick fill cap covers an orifice located on the top or upper side of the gun housing. An air inlet port is associated with the water chamber to allow air to be added to the chamber when the pump is reciprocated or operated to pressurize the water chamber. The chamber includes a water outlet port for allowing water to flow from the chamber when the trigger is pulled or depressed. The trigger is connected to a trigger valve for allowing water in the chamber to flow, via suitable conduits, to the coherent flow nozzle. In one embodiment, the nozzle includes a PVC-coated, reticulated foam plug that provides that the water flow from the nozzle is a coherent flow. The nozzle also includes a brass or other suitable metal tip. In one embodiment, the double stroke pump is situated below the barrel defined by the housing and is connected to the air inlet port. The pump has a stationary plunger or piston, a floating O-ring, and a movable cylinder portion with a one-way flap valve or valves so that it delivers air to the water chamber when the cylinder portion is manually pushed and pulled. There is a one-way ball-type valve in the air inlet orifice that prevents water from entering the pump.

BSTX:

[0009] In one embodiment, the water gun amusement device or squirt gun toy of the present invention comprises a "larger" toy water gun comprising a housing defining an elongated barrel, a light source within the housing, an on/off switch for the light source, a coherent flow nozzle, a secondary light source, a handle with a trigger, a dual action or double stroke pump with a depending handle, and a water and air inlet/outlet arrangement. Any embodiment of the present invention, but particularly the "larger" embodiments, may be connected

or coupled to a water-receiving and containing tank carried on the hip or to a back pack with a dual function air/water hose, and/or embodiments may be provided with one or more "in-gun" water receiving and containing chambers. The housing is hollow and contains within it and/or supports a light source, a battery pack and a temporary on/off switch for the light source, which may be activated by the trigger. The coherent nozzle may be generally similar to the coherent nozzle in the embodiment described above and may include a rod or other suitable light transferring device extending through the reticulated foam plug. The rod or light transfer device transfers light from the light source into an exiting stream of water. The secondary light source may be adjacent to the end of the barrel and may be located generally below the end of the nozzle.

BSTX:

[0011] In this embodiment, the water/air inlet/outlet is coupled to the water tank in the hip or back pack via a dual function hose. The hose has separate tubes for air pumped out of the gun by the dual action pump and for the water pressurized out of the water tank. The water tube connects to another water tube, via the inlet/outlet in the gun that carries the water to the nozzle when the trigger is pulled. The water tank has an inlet/outlet, generally similar to the present embodiment's inlet/outlet, whereby the dual function hose may be coupled to the tank. The tank also may have a quick fill cap covering an orifice for allowing the tank to be filled with water.

BSTX:

[0015] In any embodiment, a quick fill port may be located on the top or upper portion of the gun as opposed to the side of the gun or water pack. This helps insure that the maximum water level determined by the position of the fill port will always be above the level of any air reservoir. In embodiments of the present invention, the piston for use in the pump of the present invention will be a hollow piston. While this type of double action or dual stroke pump pressurizes air on both the push and pull strokes rather than merely on the push stroke, other pump arrangements may be used.

BSTX:

[0016] In one embodiment, the present invention provides a water gun amusement device designed to "shoot" a coherent water beam having an entrained light beam wherein, at least initially as the water beam leaves the device, the water beam and light beam are coaxial. In another embodiment, parallel light beams illuminate the water beam.

BSTX:

[0017] In one embodiment, the present invention comprises a water gun amusement device comprising a generally gun-shaped housing with a nozzle at the end, wherein the nozzle is connected by a large volume intake hose to the gun. The central chamber of the nozzle is divided by a reticulated foam plug, suitable baffle, straw stack (e.g., a plurality of parallel tubular bodies bundled or arranged with their axis parallel to the central longitudinal axis of the nozzle) or the like into a rear swirl or turbulence chamber into which the water from the hose enters and a forward linear flow or coherent flow chamber from which the pressurized water is emitted through a sharply beveled orifice. Other turbulence reducing structures and methods adapted to provide a coherent water stream may be used, e.g., shaped chambers, chamber walls, or suitable

fittings. A light transfer rod may extend partially through the nozzle into and/or past the forward end of the plug to direct light from the focused light source into the coherent stream of water being ejected through the orifice. Alternatively, a light source, e.g., an LED, may be potted or otherwise suitably mounted to emit or direct light to the forward end of the nozzle.

BSTX:

[0018] In one embodiment, the present invention provides a squirt gun amusement device including a direct pressure system comprising a water reservoir having an intake hose leading to the forward end of the barrel of the gun, an elongated barrel having an intake chamber at its forward end into which water from the intake hose can flow, a discharge hose connected between an outlet opening at the front of the intake chamber and the nozzle, a plunger and seal piston arrangement slidable within the barrel, a handle extending beyond the rear of the barrel connected to a piston rod which attaches to the plunger and the seal, and a handle locking means and a biasing spring which propels the plunger forwardly in the barrel when the locking means is released.

BSTX:

[0019] In another embodiment of the present invention, the water gun amusement device may comprise a foot operated system comprising a collapsible bellows employed to send pressurized air through a tube to the barrel of the gun.

DRTX:

[0021] FIGS. 1 is a cross-sectional view depicting one embodiment of the toy gun amusement device of the present invention.

DRTX:

[0027] FIG. 7, comprising FIGS. 7a and 7b, depicts one embodiment of the toy gun of the present, including embodiments of peripheral equipment or components of the invention and their use.

DRTX:

[0028] FIG. 8 depicts one embodiment of a pump assembly for use with the squirt gun amusement devices of the present invention.

DRTX:

[0042] FIG. 22 is a cross-sectional view of another embodiment of the toy squirt gun of the present invention.

DRTX:

[0048] FIG. 28 depicts an embodiment of a connective structure for connecting a toy squirt gun in accordance with the present invention to a water source.

DETX:

[0049] The accompanying Figures and this description depict and describe embodiments of a water gun amusement device in accordance with the present invention, and features and components thereof. The present invention also encompasses a method of making and using embodiments of the amusement device. As used herein, the phrases or terms "water gun amusement device," "toy gun," "water gun," "squirt gun" and the like are intended to encompass a structure or structures adapted project, throw, squirt, launch or shoot a generally liquid

material, such as water or the like, in a continuous stream or a broken stream of repeated, single "shots," bursts, doses or quantities of water or the like, including amusement devices of the type generally known as "squirt guns."

DETX:

[0050] With regard to fastening, mounting, attaching or connecting components of the present invention to form the water gun amusement device as a whole, unless specifically described otherwise, such are intended to encompass conventional fasteners such as screws, nut and bolt connectors, threaded connectors, snap rings, detent arrangements, clamps such as screw clamps and the like, rivets, toggles, pins and the like. Components may also be connected by adhesives, glues, welding, ultrasonic welding, and friction fitting or deformation, if appropriate, and appropriate liquid and/or airtight seals or sealing devices may be used. Electronic portions of the device may use conventional, commercially available electronic components, connectors and devices such as suitable wiring, connectors, printed circuit boards, microchips, speakers, lights, LED's, liquid crystal displays, pressure sensors, liquid level sensors, audio components, inputs, outputs and the like. Unless specifically otherwise disclosed or taught, materials for making components of the present invention may be selected from appropriate materials such as metal, metallic alloys, natural and manmade fibers, vinyls, plastics and the like, and appropriate manufacturing or production methods including casting, pressing, extruding, molding and machining may be used.

DETX:

[0052] Referring to FIGS. 1-5, embodiments of a toy water gun amusement device 30 in accordance with the present invention are depicted. Each of the depicted embodiments includes a generally gun-shaped (e.g., pistol, rifle or the like) body 32 having a stock portion 34 and a barrel portion 36. Each embodiment includes a suitable trigger mechanism assembly 38 for actuating the gun, a nozzle assembly 40 for emitting a stream of liquid, and a pump assembly 42 for pressurizing the gun. The depicted embodiments include a water or liquid receiving and/or containing pressurization tank or chamber 44; some embodiments have more than one such chamber 44 (see, e.g., FIGS. 1 and 2), in which case one such chamber may be a water containing chamber, and the other chamber may be used for further or additional pressurization of a liquid therein. Also, in some embodiments (see, e.g., FIG. 24 and 25), there may be no gun-carried chamber, use being made of an external supply or source of liquid, including such a source or supply which may be pressurized by the pump assembly 42 of the gun 30. Certain components of the squirt gun amusement device 30 of the present invention are common to the depicted embodiments and are commonly numbered in FIGS. 1-5 and the rest of the Figures.

DETX:

[0054] Referring to FIG. 7a, the toy gun amusement device 30 of the present invention may be adapted for use with an external water supply chamber 46, and/or any embodiment of the toy 30 or external supply 46 may be coupled directly to a source of pressurized water such as a garden hose 48 or typical spigot (not shown). When the external supply 46 is used, a suitable connector or transfer hose 50 may be used to operably link the gun 30 and supply 46. Referring to FIG. 7b, the hose 50 provides a water flow channel 52 and an air flow channel 54.

DETX:

[0055] With further reference to FIG. 7, and referring to FIGS. 25-27, the toy guns in accordance with the present invention and/or the external water containing tanks may be adapted to filled quickly from a source of pressurized water and to the external water containing tanks by use of a quick fill adaptor fitting 60. Referring specifically to FIGS. 25a and 25b, the quick fill connector fitting 60 comprises a male connector form 62 and female connector form 64. Each comprises a generally tubular body 66 with typical threaded hose-type connections 68 at each end. The female connector 64 includes a ball plunger 70 and flap valve 72. The tubular body 66 of the male connector includes suitable seals 74, a water ball 76 and spring 78 for urging the ball toward its closed position, basically comprising a one way valve for allowing water to flow into a water receiving tank or chamber. Water flow is depicted in FIG. 25b. FIG. 26 depicts a quick fill fitting 60 modified to quickly couple and uncouple a transfer hose 50 to a gun 30 when an external water supply is being used. The complimentary male and female connectors 62, 64 have been adapted to provide for the flow of air from the pump by providing a duct 80; the flow of water from the external supply tank is also shown. The duct 80 may be provided in either or both of the connectors 62, 64 as necessary. Note that the female portion 64 may be form integrally with or removably coupled to the gun and/or the external supply tank 46. FIG. 27 depicts an arrangement wherein the quick fill fitting is adapted to couple a source of pressurized water, e.g., a garden hose, directly to a gun 30 or tank 46. The fittings may be integrated with a gun or remote water supply tank.

DETX:

[0056] Embodiments of the toy gun amusement device of the present invention are adapted to be used with a connecting device 90 which may be known as the "Unlimitor." One end of the connecting device is depicted in FIG. 28. The device 90 comprises a selected length of suitable liquid-conducting conduit 92 having a suitable attachment fitting 96 at each end. In some embodiments, as shown at fitting 96, one or both of the fittings 96 may be bent or angled at a selected angle to facilitate coupling to the gun and/or to a water source. In use, the "Unlimitor" 90 may be coupled to a source pressurized water such as the typical house spigot so that, when the trigger is pulled to acuate the gun 30, a constant unending stream of water is shot from the gun as long as the trigger is pulled. The "Unlimitor" 90 thus obviates the need to refill or recharge the liquid-containing chamber associated with the gun 30 or the external water supply.

DETX:

[0057] One embodiment of the pump assembly 42 for use with embodiments of the toy gun amusement device 30 of the present invention is depicted in FIG. 8. The pump assembly 42 consists of a generally cylindrical pump body 96 and a pump cap 98 mounted to the body with a suitable flap valve or the like 100 just behind the pump cap 98. The pump body 96 receives a piston sub-assembly 102 comprising a piston 104 carrying a movable or "floating" O-ring 106. The other end of the pump body 96 is closed by a end plate member 108. In one embodiment, the end plate 108 may comprise a pair of disc plates equipped with suitable apertures 110 and flap valves 112 for controlling and/or permitting airflow, and a central opening in the parallel disc plates for receiving the

fixed arm 114 of the piston assembly 102. The plate 108, and thus the pump body 96, can slide freely over the piston arm 114, and the pump 42 is designed to allow the passage of air in both directions depending on the position of the floating O-ring 106 as described below. The end of the piston arm 114 is threaded to be mounted adjacent to or received in the trigger assembly 38. Referring to FIGS. 9a, 9b, 9c and 9d, the pump 42 is designed to provide air on both push and pull strokes. FIG. 9a depicts the pump 42, particularly the pump body 96, in a compressed position. FIG. 9b depicts the movement of the pump body 96 in a push direction (away from a user holding a gun 30 of the present invention) with air being pumped in the direction of the arrows. Note that the floating O-ring 106 carried by the piston 104 is moved by friction against the inside of the pump body 96 to create a seal, and the valve 100 at the end of the pump body 96 operates to permit airflow into the body and, ultimately, through the piston and into the water chamber 44 associated with the gun 30 (see, e.g., FIG. 24). FIG. 9c depicts the pump in extended position, and FIG. 9d depicts the opposite or pull stroke of the pump 42 wherein the flap valve 100 is forced closed and the floating O-ring 106 is moved to a back position to allow air to flow through the piston 104, piston arm 114, and into the water chamber 44. While this embodiment may be used with any embodiment of the present invention, other pumping arrangements may be suitable as long as the water chamber is adequately pressurized.

DETX:

[0061] FIG. 14 depicts another embodiment of the trigger assembly 38. The components are substantially similar to the embodiment depicted in FIG. 10, but this embodiment is adapted for use without the pump assembly 42. Namely, water under pressure flows directly into the trigger chamber 120 and is blocked there until the stopper 138 is moved from its seat against the plug 142 by moving the trigger member 152, at which time water flows into the conduit 160 leading to the nozzle assembly 40. Thus, as long as the water supply is constant and sufficiently pressurized, when the trigger 152 is pulled, there will be a constant stream of water "fired" by the gun 30.

DETX:

[0066] FIGS. 18a and 18b depict exemplary ratios for nozzle components which help to optimize the coherency and length of the coherent water stream "shot" by a gun 30, as well as the illumination thereof. The ratios may be varied as long as the coherency and length of the coherent water stream is not adversely affected.

DETX:

[0067] FIG. 19 depicts an embodiment of an electrical system or wiring harness and electrical components for use in embodiments of the present invention. The system includes a power source box, or battery box 250 which may be located suitably in the body 32 of a gun 30 for containing batteries or another suitable power source. Suitable wires 252 may be used to couple operable components such as LED's 254, switches 256 and speakers 258. These components may be supported and/or contained in the body 32 of guns 30 as shown and taught by referring to FIG. 22. Referring to FIG. 20, one or more portions of gun bodies 32 may be lighted or adapted to glow by providing a suitable light source such as an LED 254 mounted adjacent to a chamber 260 with transparent or translucent walls or at a transparent or translucent portion of a gun body 32.

Such light sources 254 may be actuated by pulling the trigger assembly 38 and/or by the flow of pressurized water or they may be actuated separately.

DETX:

[0069] FIGS. 22, 23 and 24 depict embodiments of toy water gun amusement devices 30 in accordance with the present invention. The depicted embodiments are exemplary, and shapes and sizes of the guns 30 and components thereof may be varied. Each embodiment comprises a generally gun-shaped (e.g., pistol, rifle or the like) body 32 having a stock portion 34 and a barrel portion 36. Each embodiment includes a suitable trigger mechanism assembly 38 for actuating the gun, a nozzle assembly 40 for emitting a stream of liquid, and a pump assembly 42 for pressurizing the gun. The embodiment depicted in FIG. 24 includes a water or liquid receiving and/or containing pressurization tank or chamber 44. In the embodiments depicted in FIGS. 24 and 25 there is no gun-carried chamber, use being made of a remote or external supply or source of liquid, including such a source or supply which may be pressurized by the pump assembly 42 of the gun 30. Referring to FIG. 23, the body 32 of the guns 30 may be formed by two or more half body portions 280, 282 which are adapted to support and contain operational components described herein, e.g., the nozzle assembly 40 (e.g., see also FIG. 16), the trigger assembly 38, the pump assembly 42 (e.g., see also FIG. 8), conduits, such as conduit 160, lighting sources or elements such as secondary light source 230 (e.g., see also FIG. 17), etc.

DETX:

[0072] In some embodiments, the light source(s) of the present invention may be an acrylic light rod, optic type fiber, light conductor or the like. In other embodiments, the light source(s) may be a wheat bulb, a phillips type bulb or a laser. Generally, it would be preferred if the selected light source is used with and provides a "glass rod" effect, e.g., a glowing or lighted water stream.

DETX:

[0075] Embodiments of the present invention may use or include a variety of light sources, including LED's, wheat bulbs or phillips type bulbs, as well as laser arrangements. Any embodiment, including those with a reflector or reflectors, might contain two or more LED's or bulbs for extra illumination. Light angle, or the angle at which light from the light sources illuminates the water and/or the area in front of the gun, may adjustable or it may be selectively set permanently at the factory. In some embodiments, a single lower light source may be used.

DETX:

[0079] Some embodiments may include a vibrator or reciprocating motorized weight to cause "bullets" or bursts of water, as well as provide tactile excitement when shooting the gun.

DETX:

[0082] The present invention encompasses the use of an "Unlimitor" 90 for providing for a continuous stream of water when the trigger is pulled. With reference to FIGS. 2 and 28, the "Unlimitor" comprises a selected length of suitable conduit or hose with a connection structure 96 at each end, typically

a male connector at one end and a female connector at the other end. The end 96 to be connected to one of the embodiments of the toy gun of the present invention may be bent, e.g., at a right angle as shown, to facilitate connection to the gun 30, and to facilitate the use of the gun 30 to accurately direct a stream or shot of water. Either or both ends could be bent or shaped to facilitate connection to a gun and/or to a water source, e.g., a spigot. The "Unlimitor" may be used with a pressure pop off valve or without. Also, the present invention is intended to encompass a multi-gun Unlimitor splitter to allow more than one "Unlimitor" to be put on the same garden hose or water source. In one embodiment, this may comprise an attachment with multiple male threaded ends. Any length of conduit or hose may be used.

DETX:

[0086] In some embodiments, a pressure switch, e.g., switch 270 depicted in FIG. 21, may be provided to activate the light source or sources, and/or the light can only come on if water is flowing through the toy or when water is shooting through or leaving the nozzle. Some embodiments, including those with larger water capacity, may include a shut-off valve at some point in the water flow path or adjacent to the end of the gun adjacent the nozzle to keep water from draining out of the water chamber when the toy is not in use. This valve may be optional for embodiments with reduced chamber size, e.g., 10 g chamber volume, since there would not be much water to drain.

DETX:

[0087] In some embodiments, the water gun amusement devices 30 of the present invention may be adapted for "back flushing," i.e., to receive water or other suitable liquid at the nozzle or other location whereby the water or liquid may flow into and/or through all or a portion of the amusement device in a cleansing flow generally in the opposite direction of the flow during regular use. In some embodiments, a threaded fitting may be provided around the nozzle of the gun, and may be adapted to fit a standard garden hose hose-end. Coupling a hose to the fitting and turning on the water, and/or pulling the trigger, allows for a reverse water flow through all or a portion of the embodiment to clean operational structures if, for example, the user notices the gun is not shooting water as well as possible due to particles stuck in the nozzle, notwithstanding the screen in the tank. In some embodiments, the tank screens and/or other operational structures may be removable, to allow for complete cleaning of the removable part and for complete back flushing and cleaning of the gun. Advantageously, periodic back flushing will likely increase the life of the water gun amusement devices of the present invention by removing sand or other particles from the device (such particles may wear down rubber seals such as those in the trigger valve). To back flush some embodiments, the front of a gun may be coupled to a hose, the tank cap(s) may be opened, and the screen(s) may be removed. The hose is then turned on, and the gun is held upside down while the trigger is pulled for a selected amount of time or until back flushing is complete. In some embodiments, the nozzle may be mounted so that it cannot be pushed back into the gun under pressure.

DETX:

[0088] The amusement devices 30 of the present invention may be used with a disappearing ink feature. In one exemplary embodiment, a suitable non-toxic powder or concentrate may be added into the tank by the user, whereby when

mixed with water and shot through the gun at a target, a temporary bright color stain will appear on the target. Any suitable chemicals may be used.

CLTX:

1. A toy gun for shooting a stream or burst of liquid, wherein the gun comprises a housing having a front end, a rear end, an internal chamber for containing a liquid and a portion for containing a source of electricity, a conduit connected to the chamber and to a nozzle at the front end, a pump for pressurizing the chamber for forcing a stream of liquid through the conduit and out of the nozzle, valve structures suitable for controlling the flow of liquid, including for making the stream of liquid coherent, a light source adjacent to the front end for illuminating a stream of liquid, means for coupling and operating the means for illuminating and the source of electricity, and a trigger mechanism connected to the housing for actuating a stream of liquid.

CLTX:

2. The toy gun according to claim 1, further comprising a purge valve mechanism operably coupled to the internal chamber.

CLTX:

3. A water gun amusement device comprising a body, water flow path structures including a nozzle assembly supported by the body, a trigger valve assembly operably coupled to the water flow path structures and to the body for controlling a water flow, and a source of electricity and at least one light source for illuminating a shot of water, wherein the shot of water is lighted and coherent.

PGPUB-DOCUMENT-NUMBER: 20020018860
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020018860 A1

TITLE: Method and apparatus for surface engineering

PUBLICATION-DATE: February 14, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Filippou, Con	Caulfield		AU	
Gutowski, Wojciech S.	Frankston		AU	
Proctor, David	Moorooduc		AU	
Spicer, Mark	Seaford		AU	

US-CL-CURRENT: 427/532,427/224 ,427/384 ,427/407.1 ,427/558

ABSTRACT:

A process for modifying the surface of a substrate containing a polymeric material by contacting the surface with the modifying agent to bond the modifying agent to the surface the process comprising providing a solution of the modifying agent in a solvent and subjecting the solution of the modifying agent to a zone of elevated temperature to vaporize the solvent and provide diffuse contact between the modifying agent and the surface of the substrate.

DATE FILED: February 12, 2001

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	DOC-ID	APPL-DATE
AU	PQ8590	2000AU-PQ8590	July 6, 2000

----- KWIC -----

BSTX:

[0050] When non-depositing plasma glow discharge treatment is used, the range of suitable energy is 5-5000 Watts for 0.1 seconds to 30 minutes, but more preferably 20 -60 Watts for 1 to 60 seconds. Preferable gases are air, oxygen, water or a mixture of these gases.

BSTX:

[0082] The said surface modification devices such as described in (a) above and in particular the surface activation means and/or graft chemical/functional chemical admission/delivery means are provided, in accordance with this invention, by a single or multiple device capable of providing of either or all: static, continuous or dynamic/pulsating mode of delivery of surface

activation means for instance surface oxidation such as but not limited to corona discharge, plasma, **glowing** arc, flame and/or other forms of ionisation, combustion, UV, laser. The examples of gliding arc are embodied in the form but not limited to corona jet devices such as those manufactured by Arcotec, Ahlbrandt, Tantec, Arcojet, LECTRO Engineering and others.

BSTX:

[0182] The said surface modification devices such as described in (a) above and in particular the surface activation means and/or graft chemical/functional chemical admission/delivery means are provided, in accordance with this invention, by a single or multiple device capable of providing of either or all: static, continuous or dynamic/pulsating mode of delivery of surface activation means for instance surface oxidation such as but not limited to corona discharge, plasma, **glowing** arc, flame and/or other forms of ionisation, combustion, UV, laser. The examples of gliding arc are embodied in the form but not limited to corona jet devices such as those manufactured by Arcotec, Ahlbrandt, Tantec, Arcojet, LECTRO Engineering and others.

DETX:

[0230] graft chemical: PEI (0.25% G35 in water):**spray hot air gun** :air temperature

PGPUB-DOCUMENT-NUMBER: 20010051488
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010051488 A1

TITLE: Method and system for interactive toys

PUBLICATION-DATE: December 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Tachau, Jeremy	Los Angeles	CA	US	
Spadoni, Aldo	Rancho Palo	CA	US	
Johnson-Williams, Mark	Verdes	CA	US	
	Moss Beach			

US-CL-CURRENT: 446/397

ABSTRACT:

The present invention provides methods and systems for an interactive toy which synthesizes sound in real time in response to changing events. At least one sensor provides continuous motion information, including at least information related to the angular position and the velocity of at least one toy portion's motion relative to a second toy portion. Each toy portion resembles portions of a vehicle. A memory is used to store data relating to a plurality of play scenarios as well as to store information related to a user's play pattern. A processor is coupled to the memory and the at least one sensor. The processor is configured to select one of the play scenarios based on at least the continuous motion information and to produce synthesized sounds resembling sounds made by real versions of at least one of the two toy portions in response to at least the continuous motion information, the play pattern information, and the selected play scenario.

DATE FILED: July 9, 2001

----- KWIC -----

DETX:

[0059] Furthermore, one or more light sensors are optionally placed at one or more locations on the toy jet. In one embodiment, these light sensors are used to detect light emitted from another toy or other light source. For example, a toy antiaircraft gun may emit visible or infrared light in response to a child firing the gun at the jet. The jet's light sensor detects when a "hit" has been scored. In another embodiment, a light sensor is used to receive data and commands, as described below.

DETX:

[0079] Another scenario will now be described to further illustrate the flexibility and immersive quality of one embodiment of a toy aircraft. The play session may begin when a child grasps the airplane while the airplane is on the ground. This grasping action is sensed using either a heat sensor, a pressure sensor or other types of sensors. In response, the toy synthesizes a jet engine sound at idle. The airplane is made to vibrate in coordination with the engine idle sound. In addition, a light simulating engine flames is activated to burn dimly. As the airplane is rolled forward on its landing gear by either the child or under motorized control, the engine sound volume and pitch is increased to indicate the engine is speeding up. The vibration level is increased contemporaneously with the change in engine sound as is the engine light brightness. A pressure sensor coupled to the landing gear or an internal tilt sensor is used to detect if the child has picked the airplane off the ground and is "flying" the airplane. An accelerometer, tilt sensor or the like is used to detect that the child is moving the plane forward, and in response, the engine sound changes to an afterburner sound with the engine light glowing brightly. As the child banks the airplane, corresponding airflow "whoosh" sounds are made. If the child rotates the wings into a swept wing configuration, corresponding mechanical and airflow sounds are synthesized. The airplane, under processor control, may then enact a "damage" scenario. Thus, scenario involves simulating that the toy has been hit by cannon fire. The scenario may be initiated at randomly, in response to optically detecting "gunfire" from another toy, or in response to other stimuli. In simulating a hit, the toy will synthesize the sound of shells tearing into metal. An actuator is then commanded to release a portion of the airplane, such as a tail wing, to simulate damage. An engine sputtering sound is synthesized, with a corresponding variation in the toy vibration. The engine light may be caused to flicker as well. A klaxon sound may also be synthesized, along with the pilot's voice calling "mayday! mayday!"

PGPUB-DOCUMENT-NUMBER: 20010049249
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010049249 A1

TITLE: Method and system for interactive toys

PUBLICATION-DATE: December 6, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Tachau, Jeremy	Los Angeles	CA	US	
Spadoni, Aldo	Rancho Palo	CA	US	
Johnson-Williams, Mark	Verdes	CA	US	
	Half-Moon Bay			

US-CL-CURRENT: 446/397,446/230 ,446/405 ,446/409 ,446/465

ABSTRACT:

The present invention provides methods and systems for an interactive toy which synthesizes sound in real time in response to changing events. At least one sensor provides continuous motion information, including at least information related to the angular position and the velocity of at least one toy portion's motion relative to a second toy portion. Each toy portion resembles portions of a vehicle. A memory is used to store data relating to a plurality of play scenarios as well as to store information related to a user's play pattern. A processor is coupled to the memory and the at least one sensor. The processor is configured to select one of the play scenarios based on at least the continuous motion information and to produce synthesized sounds resembling sounds made by real versions of at least one of the two toy portions in response to at least the continuous motion information, the play pattern information, and the selected play scenario.

DATE FILED: July 9, 2001

----- KWIC -----

DETX:

[0059] Furthermore, one or more light sensors are optionally placed at one or more locations on the toy jet. In one embodiment, these light sensors are used to detect light emitted from another toy or other light source. For example, a toy antiaircraft gun may emit visible or infrared light in response to a child firing the gun at the jet. The jet's light sensor detects when a "hit" has been scored. In another embodiment, a light sensor is used to receive data and commands, as described below.

DETX:

[0079] Another scenario will now be described to further illustrate the flexibility and immersive quality of one embodiment of a toy aircraft. The play session may begin when a child grasps the airplane while the airplane is on the ground. This grasping action is sensed using either a heat sensor, a pressure sensor or other types of sensors. In response, the toy synthesizes a jet engine sound at idle. The airplane is made to vibrate in coordination with the engine idle sound. In addition, a light simulating engine flames is activated to burn dimly. As the airplane is rolled forward on its landing gear by either the child or under motorized control, the engine sound volume and pitch is increased to indicate the engine is speeding up. The vibration level is increased contemporaneously with the change in engine sound as is the engine light brightness. A pressure sensor coupled to the landing gear or an internal tilt sensor is used to detect if the child has picked the airplane off the ground and is "flying" the airplane. An accelerometer, tilt sensor or the like is used to detect that the child is moving the plane forward, and in response, the engine sound changes to an afterburner sound with the engine light glowing brightly. As the child banks the airplane, corresponding airflow "whoosh" sounds are made. If the child rotates the wings into a swept wing configuration, corresponding mechanical and airflow sounds are synthesized. The airplane, under processor control, may then enact a "damage" scenario. Thus, scenario involves simulating that the toy has been hit by cannon fire. The scenario may be initiated at randomly, in response to optically detecting "gunfire" from another toy, or in response to other stimuli. In simulating a hit, the toy will synthesize the sound of shells tearing into metal. An actuator is then commanded to release a portion of the airplane, such as a tail wing, to simulate damage. An engine sputtering sound is synthesized, with a corresponding variation in the toy vibration. The engine light may be caused to flicker as well. A klaxon sound may also be synthesized, along with the pilot's voice calling "mayday! mayday!"

US-PAT-NO: 6346025

DOCUMENT-IDENTIFIER: US 6346025 B1

TITLE: Methods and systems for joints useable in toys

DATE-ISSUED: February 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tachau; Jeremy	Los Angeles	CA	N/A	N/A
Spadoni; Aldo	Rancho Palo	CA	N/A	N/A
Verdes				

US-CL-CURRENT: 446/71,403/114 ,446/487

ABSTRACT:

The present invention provides methods and systems for toy joints. A first toy portion is rotatably and pivotally coupled to a toy body. A second toy portion is also rotatably positioned about the toy body, so that the second toy portion can be rotated at least partly about the toy body. A third toy portion is rotatably positioned about the toy body so that the third toy portion can be rotated to a position opposite the second toy portion.

4 Claims, 54 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 44

DATE FILED: June 18, 1999

----- KWIC -----

DEPR:

Furthermore, one or more light sensors are optionally placed at one or more locations on the toy jet. In one embodiment, these light sensors are used to detect light emitted from another toy or other light source. For example, a toy antiaircraft gun may emit visible or infrared light in response to a child firing the gun at the jet. The jet's light sensor detects when a "hit" has been scored. In another embodiment, a light sensor is used to receive data and commands, as described below.

DEPR:

Another scenario will now be described to further illustrate the flexibility and immersive quality of one embodiment of a toy aircraft. The play session may begin when a child grasps the airplane while the airplane is on the ground. This grasping action is sensed using either a heat sensor, a pressure sensor or other types of sensors. In response, the toy synthesizes a jet engine sound at idle. The airplane is made to vibrate in coordination with the engine idle sound. In addition, a light simulating engine flames is activated to burn dimly. As the airplane is rolled forward on its landing gear by either the child or under motorized control, the engine sound volume and pitch is increased to indicate the engine is speeding up. The vibration level is increased contemporaneously with the change in engine sound as is the engine light brightness. A pressure sensor coupled to the landing gear or an internal

tilt sensor is used to detect if the child has picked the airplane off the ground and is "flying" the airplane. An accelerometer, tilt sensor or the like is used to detect that the child is moving the plane forward, and in response, the engine sound changes to an afterburner sound with the engine light glowing brightly. As the child banks the airplane, corresponding airflow "whoosh" sounds are made. If the child rotates the wings into a swept wing configuration, corresponding mechanical and airflow sounds are synthesized. The airplane, under processor control, may then enact a "damage" scenario. Thus, scenario involves simulating that the toy has been hit by cannon fire. The scenario may be initiated at randomly, in response to optically detecting "gunfire" from another toy, or in response to other stimuli. In simulating a hit, the toy will synthesize the sound of shells tearing into metal. An actuator is then commanded to release a portion of the airplane, such as a tail wing, to simulate damage. An engine sputtering sound is synthesized, with a corresponding variation in the toy vibration. The engine light may be caused to flicker as well. A klaxon sound may also be synthesized, along with the pilot's voice calling "mayday! mayday!"

US-PAT-NO: 6210287

DOCUMENT-IDENTIFIER: US 6210287 B1

TITLE: Interactive arena play structure

DATE-ISSUED: April 3, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Briggs; Rick A.	Springfield	IL	N/A	N/A

US-CL-CURRENT: 472/128,273/394 ,472/136

ABSTRACT:

An interactive arena play structure is provided incorporating a plurality of water and non-water play elements for creating various desired water effects. The interactive arena play structure incorporates a centrally disposed target tower which controls various water effects located within or around the play structure. Play participants are encouraged to compete against one another to actuate various water effects such that they stay dry while their opponents get wet. In addition, play participants are encouraged to cooperate to actuate a special progressive water effect located in a centrally disposed region of the play arena.

41 Claims, 12 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 12

DATE FILED: September 16, 1998

----- KWIC -----

BSPR:

In accordance with one embodiment of the present invention, a water play arena is provided for entertaining one or more play participants. The water play arena contains a central target tower which is adapted to actuate special water effects strategically placed among the play participants. The play participants activate the special water effects through the use of various devices, such as a variety of water guns. For example, a play participant may spray a stream of water from a water gun such that a target is struck. Once the target is struck, a controlled valve opens and allows a second stream of water to create a desired water or other effect. By providing targets of various levels of difficulty, play participants of all ages are able to engage in play at the same time and in the same arena.

DEPR:

A "multiple order" water effect may be defined as one in which a later action relies upon the occurrence of an earlier action. For example, pump guns allow play participants to pump water from a pump basin or tub to form a cohesive stream of water which may be directed at a target or other play participants. Before the pump guns may be activated, however, it is first necessary to provide the guns with the required ammunition by filling the pump basins with water. This may be done, for instance, by manipulating another valve or by

operating an adjacent water effect in order to fill the pump basin. Thus, the first effect is filling the pump basin and the second effect is causing a stream or spray of water to issue from the water gun. Those skilled in the art will appreciate that the number and variety of such "multiple order" water effects are virtually unlimited.

DEPR:

As seen in FIG. 1, the guns 126 can be used to shoot water at other play stations 102, play participants, or the target tower 104. The target tower 104 supports interactive targets 110 which control various water play elements. Activating a specific target on the tower 104 will create a flow of water to a runnel 130. The present funnel 130 and an attached pipe 132 will pour water over the runnel area. Activating another specific target will create a stream of water through a set of jet sprayers 134 located on a play station 102. The present jet sprayers 134 direct a spray of water over the gun region of the play station 102. Activating a third specific target will activate the central geyser 136. As mentioned above, successive activations within a timed interval can increase or decrease the flow rate and, accordingly, alter the height of the geyser reaction. Additionally, activating a specific target will create a flow of water into a bucket 140 mounted above the play stations 102. Preferably, the present bucket 140 will spill its contents when enough water is poured into it as described below.

DEPR:

The illustrated play arena of FIG. 1 features three play stations 102 placed around the perimeter of a centrally located target tower 104. Preferably, at least two play stations 102 are disposed around the circumference of the target tower 104. As shown in FIG. 1 and indicated above, the target tower 104 is located above a center pond 106. The present play arena 100 has a geyser 136 located within the frame work of the target tower 104 such that, when activated, the geyser 136 sprays upward within the tower 104 simulating an oil geyser, for example. Notably, the water could also include dyes or the like to create slime, luminescence, glow-in-the-dark effects or other similar effects well known in the art.

DEPR:

After the transfer of water to the upper basin 124 has been completed, the play participants can then make use of the water in a variety of ways. In a preferred embodiment, the water is utilized as ammunition for one or more compression guns 192. As will be appreciated, any type of water gun can make use of the water. In addition, the water contained in the upper basin 124 can be thrown, dumped, ladled or used in a similar method by the play participants.

DEPR:

In addition to an assortment of interactive targets 110, the target tower 104 can also contain a number of other targets which activate effects such as, but not limited to, bells, buzzers, lights, indicators, sound effects, and other similar items. For example, a target 110 can capture a stream of water from a water gun and redirect or break-up that stream to create a desired effect. As is evident from FIG. 10, the targets 110 can be varied in shape and type.

DEPR:

A similar target to the anemometer 266 is the paddle wheel 270. Water from the water stream shot from a water gun contacts the paddles of the paddle wheel 270. The force of the water stream on the paddle wheel paddles causes the paddle wheel 270 to rotate about a center shaft. The rotation can activate a solenoid valve and create a secondary water effect. Other targets can be spinners, funnels, and pressure sensitive contact surfaces. Those skilled in the art will recognize a wide variety of other types of targets can readily be used to create or activate other play or water effects.

CLPR:

6. The water play attraction of claim 5 wherein said water forming element comprises a pump gun arranged and configured to allow play participants to direct a stream of water at said one or more target structures.

CLPR:

22. The kit of claim 21 wherein said water forming element comprises a pump gun arranged and configured to allow play participants to direct a stream of water at said one or more target structures.

CLPR:

33. The water play attraction of claim 30 wherein at least one of said water play elements comprises a pump gun arranged and configured to allow play participants to direct a stream of water at said one or more target structures.

US-PAT-NO: 6206748

DOCUMENT-IDENTIFIER: US 6206748 B1

TITLE: Simulated weapon using holographic images

DATE-ISSUED: March 27, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kauth; Christopher	San Francisco	CA	94104	N/A

US-CL-CURRENT: 446/219,359/33 ,446/473 ,446/485 ,472/61

ABSTRACT:

A simulated weapon is disclosed which uses a hologram, an electric lamp and various other optical components to produce holographic images resembling the rays or beams of ray guns or space guns as portrayed in motion pictures, television programs, video games, and comic books in that the rays extend into and occupy space in front of the device itself but are not tangible. Sound effects accompany the projection of holographic images. The device also provides ancillary visual effects prior to the display of holographic images. Sound effects accompany the ancillary visual effects. The toy is intended for floor use and can be mounted on toy tank treads or other conveyance means. The rays are visible to those sitting, kneeling, or standing in front of the device. The preferred embodiment of the device is powered by an electric storage battery.

20 Claims, 6 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 5

DATE FILED: May 4, 1998

----- KWIC -----

BSPR:

Other simulated weapons have sought to rely on lighting effects alone to create the impression of muzzle flashes. For example, U.S. Pat. No. 5,283,970 to Aiger discloses a toy gun which relies entirely on a red light, which shows intermittently as the invention's barrel assembly rotates, to provide the impression of muzzle flashes.

DEPR:

The image projected by hologram 22 and reduced to a single color and form by color filter 24 appears to be four segmented columns arranged in a two-by-two pattern which spread out, away from each other, as their distance from the surface of color filter 24 increases. The columns appear to begin in the interior of the invention and extend forward into space. The individual segments are glowing red, everything else in the image is black. The effect created is as though several pulses of rays or beams from the invention had been fired. This holographic image is described to further disclose how hologram 22 and color filter 24 operate and should not be regarded as limiting the appearance of holographic images projected by the invention.

US-PAT-NO: 6174242

DOCUMENT-IDENTIFIER: US 6174242 B1

TITLE: Self-contained interactive play structure

DATE-ISSUED: January 16, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Briggs; Rick A.	Springfield	IL	N/A	N/A
Weston; Mark	North Attleboro	MA	N/A	N/A
Weston; Denise	North Attleboro	MA	N/A	N/A
Cuddihee; Brendan	Eureka	MO	N/A	N/A

US-CL-CURRENT: 472/136,472/116

ABSTRACT:

A self-contained interactive play structure is provided having an outer housing and a plurality of towers disposed within the housing. A plurality of play media including impact-safe projectile accelerators are disposed throughout the structure. A central targeting area is provided having targets which, when contacted by a projectile, activate desired play effects. A projectile conveyor system supplies projectiles to be shot from the projectile accelerators.

54 Claims, 17 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 11

DATE FILED: March 26, 1999

----- KWIC -----

BSPR:

On the other hand, there are certain unique aspects and desirable play dynamics of wet play structures which, heretofore, have not been satisfactorily met by their dry counterparts. For example, an especially exciting and entertaining play activity supported by a wet play structure involves shooting a stream of water at selected targets and/or other play participants. This usually entails some form of a water cannon, water gun, squirt gun, spray hose or the like, which play participants can operate to surprise other play participants or to achieve desired effects. Such participatory play activities provide particular benefits in developing children's motor skills and hand-eye coordination. It also provides endless fun for play participants, who enjoy the challenge of trying to hit various targets and/or one another.

DEPR:

FIGS. 16 and 17 show another embodiment of a themed projectile accelerator 100. The particular projectile launcher 100 is themed as a "spinach oven" and launches projectiles out of a barrel 102 formed in its "chimney" 104. Graphics 106 on a front 107 of the accelerator 100 represent glowing ambers burning inside an oven. A side 109 of the oven has a graphic 108 depicting "Popeye." Actuation of a handle 110 by a play participant triggers the launching of a

ball or other projectile out of the chimney 104.

US-PAT-NO: 6095526

DOCUMENT-IDENTIFIER: US 6095526 A

TITLE: Columnar race game

DATE-ISSUED: August 1, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cook, II; Jack D.	Ormond Beach	FL	N/A	N/A

US-CL-CURRENT: 273/349,273/445

ABSTRACT:

A columnar race game having columns that move in a vertical direction. The object of the game is to hit a target causing actuation of the column in the vertical direction. The first column to reach a uppermost point activates a detection device which stops the game and signals the winner of the game.

29 Claims, 9 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 8

DATE FILED: November 18, 1998

----- KWIC -----

BSPV:

2.) consists of a unique glow rod and platform configuration;

DRPR:

FIG. 9 illustrates a front elevational view of one embodiment of a water gun used with the present invention.

DEPR:

The device used to activate the activation device 24 may vary. For example, a water gun 28 may be used (FIG. 9 illustrates a front elevational view of one embodiment of a water gun used with the present invention). In other embodiments, a laser gun, an air gun, or a projectile gun may be used. In a preferred embodiment, the guns are attached on the consoles 14, one gun in front of each of the targets, or activation devices 24.

DEPR:

In operation, multiple players seated at the consoles 14 of the game structure use a water gun 28, or other projectile means, to actuate a target 24 or actuation means. Hitting the target 24 causes the columns 22 to rise up in the vertical direction from a down position. In one embodiment, each of the columns 22 rise up through holes located in the cabinet 16 of the game structure. The first column 22 that reaches a predetermined level, e.g., uppermost position, activates a detection means which causes actuation of a "winner" light located in relation to the column 22.

CLPR:

18. A columnar race game according to claim 17, wherein said first means for activating said first activation device is a water gun.

US-PAT-NO: 6064686

DOCUMENT-IDENTIFIER: US 6064686 A

TITLE: Arc-free electron gun

DATE-ISSUED: May 16, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Zuniga; Luis A.	Grass Valley	CA	N/A	N/A
LaFrance; Michael E.	Columbia	CA	N/A	N/A
Willitzer; Larry F.	Rodeo	CA	N/A	N/A
Johnson; Christopher S.	Sunnyvale	CA	N/A	N/A

US-CL-CURRENT: 373/13,219/121.27 ,373/14

ABSTRACT:

An electron gun that prevents undesirable arcing by providing an improved electrostatic field that generates a confined electron stream, an improved magnetic field that directs the confined electron stream to a crucible with minimal divergence, and an improved insulation on high voltage leads. The improved electrostatic field is provided by a cathode plate disposed adjacent to a filament and forming a cathode window aligned to the filament. An anode plate disposed adjacent to the cathode plate forms an anode window aligned to the cathode window. The cathode plate and anode plate form an electrostatic field and lensing effect that directs electrons emitted from the filament through the cathode and anode windows with minimal divergence. The improved magnetic field is provided by a magnet having a pair of poles, a pair of extension plates each extending from the magnet poles, and a plurality of extension members that extend from the extension plates toward the path of the electron stream. The magnet, pair of extension plates and plurality of extension members provide a uniform magnetic field along the electron stream path to guide the electron stream to the crucible with a minimum of divergence. The improved insulation on high voltage leads is possible because a cooling fluid jacket member forms first channels through which insulated high voltage wires pass that connect to the filament and anode/cathode plates, a second channel through which cooling fluid flows in order to cool the first channels and the wires therein.

21 Claims, 14 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 7

DATE FILED: March 30, 1999

----- KWIC -----

BSPR:

One solution is proposed in U.S. Pat. No. 5,216,690 (issued to Hanks), in which a shield is added that surrounds all of the high voltage surfaces. The shield is grounded, and spaced from the HV surfaces by a distance that is below the mean free path of electrons at the highest pressure anticipated. The electrons making the transit, although accelerating quickly going from -KV

cathode surface to nearby ground, have minimal ion collision probability over the entire distance. The electrons merely transfer to ground a minimal amount of energy. This suppresses arc-downs and glow discharges. However, the drawback to this type of e-gun is that the rigid ground shielded high voltage leads make it extremely difficult to install the device.

DEPR:

During operation, cooling water is circulated through water path 90. The flowing cooling water keeps the temperature of various E-gun elements at a safe temperature even if the chamber interior reaches temperatures that would otherwise destroy high-temperature intolerant elements. For example, the flowing cooling water keeps the insulation around the wires 84/85 from being damaged by high temperatures. The presence of the insulation prevents arcing between the two wires 84/85 and ground. The cooling water also keeps the insulating block 78 and high voltage leads 88/89 from melting under the high chamber temperatures.

US-PAT-NO: 6048670

DOCUMENT-IDENTIFIER: US 6048670 A

TITLE: Powder-blasting method

DATE-ISSUED: April 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bosman; Joseph C.M.	Eindhoven	N/A	N/A	NLX
Tolner; Harm	Eindhoven	N/A	N/A	NLX
Ligthart; Henricus J.	Eindhoven	N/A	N/A	NLX
De Haas; Franciscus C.M.	Eindhoven	N/A	N/A	NLX

US-CL-CURRENT: 430/323,451/31

ABSTRACT:

Method of providing a pattern of apertures and/or cavities in a plate of material which is suitable for powder blasting, or of cutting pieces from a plate (2) of such a material by means of powder blasting, using a non-metal layer of blast-resistant material (3) as a mask which is patterned while or after it is fixedly provided on the surface of the plate.

2 Claims, 9 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 4

DATE FILED: November 12, 1997

----- KWIC -----

BSPR:

Removing material may be understood to mean, for example, the provision of cavities and/or apertures, but also a process of cutting shapes (for example, discs) by way of powder blasting. The cavities may be, for example, slots, pits or grooves. Plates which are suitable for powder blasting are particularly made of hard, brittle materials such as glass or ceramic material (for example, ferrite, a sintered oxidic ferromagnetic material). The plates may be made of an insulating material (for example, glass), an electrically conducting material (for example, some types of ferrite) or a semiconducting material (for example, silicon and some types of ferrite). These types of plates are particularly used in flat lamps, meander lamps, TL lamps, luminescent gas discharge displays such as plasma displays, field emission displays, cathode ray tube displays and electron duct displays in which electrons are propagated in ducts having walls of insulating material in which the apertures and/or cavities are used for manipulating electron currents. They may be formed, for example, as control plates provided with addressable electrodes, as transport plates in which parallel cavities constitute ducts, and as spacer plates which may be placed, for example, between a control plate and a luminescent screen in a luminescent display.

DEPW:

spraying, by means of a high-pressure spray gun, soap water of, for example, 30.degree. C. on the glass plate (2) provided with the coating material (3). (By means of this method, the unexposed parts of the coating material (3) are extra-satisfactorily removed and there is little damage.)

US-PAT-NO: 6048280

DOCUMENT-IDENTIFIER: US 6048280 A

TITLE: System for luminescing and propelling a projectile

DATE-ISSUED: April 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Palmer; Stephen L.	Cameron Park	CA	N/A	N/A
Palmer; William R.	Cameron Park	CA	N/A	N/A

US-CL-CURRENT: 473/416,124/1 ,124/16 ,273/DIG.24 ,473/570

ABSTRACT:

A projectile having photoluminescent properties is exposed to light within a gun when propelled from the gun to excite the photoluminescent surface and provide a visual display by the propelled projectile. The projectile is illuminated by a flash lamp, such as a xenon flash lamp, having a high level ultraviolet light component and relatively low or non-existent red, orange and infrared components.

6 Claims, 4 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: July 10, 1997

----- KWIC -----

TTL:

System for luminescing and propelling a projectile

BSPR:

This invention relates to a method and apparatus for luminescing and propelling a projectile. The preferred embodiment disclosed herein has particular application to toy guns wherein a projectile simulating a tracer round is fired by the user. However, the invention does have application to other arrangements wherein it is desired to fire projectiles which emit a light, an example being a signal gun.

BSPR:

The preferred form of apparatus disclosed herein relates to a toy gun which utilizes one or more photoluminescent projectiles to simulate tracer rounds. Typically, tracer ammunition utilized in actual weaponry contains a small pyrotechnic charge positioned in a hollow portion of a projectile. When the propelling charge is burned, the tracer charge is ignited and burns brightly as the projectile proceeds toward the intended target. Due to the photochemical persistence of the human eye, this traveling light source is perceived as an arc of light. When tracer ammunition is used at night, the trajectory of the projectile is easily monitored by this display.

BSPR:

With the present invention simulation of tracer bullets or other projectiles is simulated without the use of a burning projectile component. The structural elements and method steps utilized to accomplish the intended result are relatively simple, inexpensive and address the concerns of safety. The invention utilizes photoluminescent projectiles which are rapidly charged by superlumination to provide a toy that is not only inherently safe but highly interesting. The photoluminescent glow of the projectiles remains visible for a considerable length of time, making it a relatively easy matter to locate the projectiles in the dark after they have been projected.

BSPR:

U.S. Pat. No. 5,311,413 discloses a device for energizing glow bait used for fishing using a flash lamp. The bait is exposed to the light from the flash lamp while the container of the device is closed. A lid is then opened and the bait manually removed by the fisherperson who then uses it in a conventional manner as bait.

BSPR:

The apparatus of the present invention is for luminescing and propelling a projectile at least partially comprised of photoluminescent material.

BSPR:

Light emitting means of a specified character is incorporated in the apparatus for illuminating a projectile at least partially comprised of photoluminescent material in the space to excite the photo-luminescent material.

DRPR:

FIG. 1 is a sectional view of apparatus constructed in accordance with the teachings of the present invention with the structural elements thereof illustrated in the relative positions assumed thereby preparatory to luminescing and propelling a projectile in the form of a dart;

DEPR:

Referring now to the drawings, a toy gun 10 is illustrated, the toy gun including a housing 12 with a barrel 14 has an open end 16 and a barrel interior of circular cross-section leading from open end 16.

DEPR:

A nozzle element 20 comprising a portion of the toy gun's projectile propulsion system extends into the interior space of barrel 14. Nozzle 20 leads from a pneumatic cylinder 22.

DEPR:

Compressed air movement through the nozzle end will propel a projectile of a specified character. More particularly, the projectile for use with the toy gun is a dart 40 having a suction cup 42 at an end thereof. Dart 40 has a main body portion 44 defining a recess 46 which receives the nozzle 20 preparatory to firing of the toy gun. Preferably, the main body portion of the dart is constructed of a soft material such as plastic foam.

DEPR:

The toy gun structure described above is known in the prior art. The

projectile conventionally fired by the toy gun just described does not emit light when fired and consequently does not approximate the action of a tracer bullet or projectile. In fact, a projectile such as dart 40 will be very difficult if not impossible to see when fired in the dark.

DEPR:

With the structure now to be described the photoluminescent material is exposed to light from a light source while the projectile is within the space defined by the barrel 14 of the toy gun. In the arrangement illustrated, light emitting means in the form of a xenon flash lamp 50 is located within the confines of the barrel. More particularly, the lamp 50 is supported on a transparent support 52 constructed of plastic or the like adjacent to a dart 40 disposed on nozzle 20 as shown in FIG. 1. Flash lamp 50 is connected to a suitable circuit of the type utilized to power and trigger xenon flash lamps such as those commonly employed for flash photography. FIG. 4 illustrates a typical circuit of this type. The actual circuit components are generally designated by reference numeral 54 in FIG. 1 and 2. The source of power is a battery 56, for example, a AA alkaline battery.

DEPR:

The projectile will emit light as it exits the toy gun and proceeds to its destination.

DEPR:

Not only is a flash lamp of the type exemplified by a xenon flash lamp far more efficient in the conversion of electrical energy to light, but also particularly in the production of desirable ultraviolet light where it is approximately 1,000 times more efficient than incandescent lamps. Employment of a flash lamp such as a xenon flash lamp having a high level ultraviolet component and relatively low or non-existent red, orange and infrared components provides for unexpected, phenomenally improved results when illuminating and projecting a projectile from a toy gun barrel.

CLP^R:

1. Projectile propelling and illuminating apparatus for luminescing and propelling a projectile at least partially comprised of photoluminescent material having an excitation band of determinable wavelength, said apparatus comprising, in combination:

US-PAT-NO: 6030272

DOCUMENT-IDENTIFIER: US 6030272 A

TITLE: Toys having gyroscope-based motion resisting action

DATE-ISSUED: February 29, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hu; Antonio C.	Menlo Park	CA	N/A	N/A

US-CL-CURRENT: 446/233,446/473

ABSTRACT:

Toys, e.g., swords, guns, shields, to be held in the hand of a user and manipulated/moved. The interior of each of the toys includes a gyroscope, which when operated creates considerable rotational momentum, tending to resist the movement of the toy by the user. This action enhances the user's fun. The toys include a molded plastic housing having a hollow interior portion and a hand-grip portion arranged to be grasped in the hand of a user to lift the toy and manipulate it in various orientations. The gyroscope is mounted within the housing, e.g., in the handle portion. An electric motor is provided for rotating the gyroscope. The motor is powered by a power supply, e.g., a battery pack, located within the housing. A manual, on-off switch is provided in the toys for enabling the electric power from the batteries to energize the motor. Plural lamps are also provided for illuminating portions of the toy when the manual, on-off switch is closed.

12 Claims, 8 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 5

DATE FILED: November 2, 1998

----- KWIC -----

DRPR:

FIG. 7 is a side elevational view of another exemplary embodiment of toy constructed in accordance with this invention, in this case a **toy simulating a futuristic gun**; and

DEPR:

In accordance with one preferred aspect of this invention, as mentioned above, the toy sword also includes the heretofore identified illumination means 38. These means are provided for illuminating portions of the toy when it is used. The illumination means basically comprises a first light bulb or lamp 38A which is located within the hand-guard portion domed wall 24A immediately below the lower end of the sword blade as shown in FIG. 2. The lamp 38A includes a pair of conductors (not shown) which form a portion of the electrical circuit. Accordingly, when the manual on-off switch is depressed and the gyroscope starts to spin the lamp 38A illuminates. The light produced by the lamp 38A passes up through the hollow interior of the sword blade 26, thereby causing the blade to "**glow**." If the blade portion of the sword is constructed so that

it is not hollow, i.e., is a solid member, then it is preferable that the material making up the blade portion be transparent so that the light produced by the lamp 38A will be propagated up the length of the solid blade portion to cause it to glow.

DEPR:

In FIG. 7 there is shown an alternative embodiment of the toy of this invention. In the embodiment shown in that figure toy is in the form of a "futuristic" gun 100. The gun includes a handle or hand-grip portion 102, a hand-guard portion 104, and a barrel portion 106. Like the sword 20, the gun 100 in the form of a hollow shell, which is molded of any suitable material, such as plastic, and may be fabricated of any number of components secured together to form the unit shown. The gun includes the same operative components, e.g., the gyroscope, the motor, the manual on-off switch, etc. as described heretofore. Those components, e.g., the motor 34, gyroscope wheel 42, lamps 38B, etc., are located within the handle portion 102. The lower end of the handle portion 102 is constructed like the sword, so that it includes a transparent window 66 through which the rotating gyroscope wheel may be seen, and through which light produced by the lamps 38B may pass. The lamp 38A may be located within the barrel portion 102 of the gun 100 to illuminate it.

CLPR:

11. A toy comprising a molded plastic housing having a hollow interior portion, said housing including a hand-grip portion arranged to be grasped in the hand of a user to lift the toy and manipulate it in various orientations, a gyroscope mounted on a portion of said housing, an electric motor connected to said gyroscope to cause the gyroscope to operate when said motor is energized, and a power supply connected to said motor for energizing said motor, whereupon the operation of said gyroscope tends to resist reorientation of the toy, said housing being shaped to give the appearance of a gun, said gun having a hand-grip portion and a barrel portion, said gyroscope, said motor, and said power supply being located within said handgrip portion of said toy.

US-PAT-NO: 5944975

DOCUMENT-IDENTIFIER: US 5944975 A

TITLE: Method of forming a lift-off layer having controlled adhesion strength

DATE-ISSUED: August 31, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wilson; Arthur M.	Richardson	TX	N/A	N/A
Shen; Chi-Cheong	Richardson	TX	N/A	N/A
Ramamurthi; Saroja	Allen	TX	N/A	N/A

US-CL-CURRENT: 205/122,205/159 ,205/170 ,205/183 ,205/188 ,205/191 ,205/198 ,205/221 ,205/223 ,216/11 ,216/40 ,313/309 ,313/336 ,445/47 ,445/50

ABSTRACT:

A method of fabricating an emitter plate 12 for use in a field emission device comprising the steps of providing an insulating substrate 18 and forming a first conductive layer 13 on the insulating substrate 18. This is followed by the steps of forming an insulating layer 20 on the first conductive layer 13 and forming a second conductive layer 22 on the insulating layer 20. Then, a plurality of apertures 34 are formed through the second conductive layer 22 and through the insulating layer 20. A lift-off layer 36 is then formed on the second conductive layer 22. The lift-off layer 36 is formed by a plating process wherein the plating bath has a pH between 2.25 and 4.5, and current densities of 1 to 20 mA/cm.sup.2. The method may further comprise depositing conductive material through the plurality of apertures 34 to form a microtip 14 in each of the plurality of apertures 34. The excess deposited conductive material 14' and the lift-off layer 36 are then removed from the second conductive layer 22.

18 Claims, 5 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: January 24, 1997

----- KWIC -----

BSPR:

For more than half a century, the cathode ray tube (CRT) has been the principal electronic device for displaying visual information. The widespread usage of the CRT may be ascribed to the remarkable quality of its display characteristics; namely, color, brightness, contrast and resolution. One major feature of the CRT permitting these qualities to be realized is the use of a luminescent phosphor coating on a transparent faceplate.

DEPR:

Anode 10 also comprises a cathodoluminescent phosphor coating 24, deposited over conductive film 28 so as to be directly facing and immediately adjacent gate electrode 22. In the Clerc patent, the conductive bands of each series are covered with a phosphor coating which luminesces in one of the three

primary colors, red, blue and green.

DEPR:

During display operation, selected groupings of microtip emitters 14 are energized by applying a negative potential to layer 13, functioning as the cathode electrode, relative to the gate electrode 22, via a voltage supply (not shown), thereby inducing an electric field which draws electrons from the apexes of microtips 14. The freed electrons are accelerated toward the anode plate 10 which is positively biased by the application of a substantially larger positive voltage from a voltage supply (not shown) coupled between the gate electrode 22 and conductive film 28 functioning as the anode electrode. Energy from the electrons attracted to the anode conductive film 28 is transferred to particles of the phosphor coating 24, resulting in luminescence. The electron charge is transferred from phosphor coating 24 to conductive film 28, completing the electrical circuit to the voltage supply.

DEPR:

Furthermore, more than one material may be evaporated to form the microtips. For example, the microtips may be comprised of niobium coated with molybdenum or any other low work function material. Lastly, the lift-off layer and overburden material may be removed by other procedures well known in the art, such as sonic bath, water spray, or air gun.

US-PAT-NO: 5940922

DOCUMENT-IDENTIFIER: US 5940922 A

TITLE: Easy insert composite tube cleaner

DATE-ISSUED: August 24, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Saxon; Gregory J.	Oakmont	PA	N/A	N/A
Krysicki; Jerzy	Oakmont	PA	N/A	N/A

US-CL-CURRENT: 15/104.061,15/104.16

ABSTRACT:

A composite tube cleaner has a shaft, nose portion and tail portion, and a plurality of metallic scraper devices spaced along the shaft. The scraper devices are U-shaped and have at least two leg portions which terminate as scraping sections. A plastic sheath is secured to and encloses the scraping sections and at least a portion of the leg portions, the sheath preferably having at least one inclined surface along the leg portion which extends outwardly to the scraping section.

16 Claims, 4 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 2

DATE FILED: September 12, 1997

----- KWIC -----

BSPR:

The present invention is to a tube cleaning device for use in cleaning the inner wall of a tube or conduit, and more specifically to a tube cleaner that is insertable into an open end of a tube, such as a condenser tube, and forced through the tube by a fluid, such as water, discharged from pressurized fluid gun to remove deposits on the inner wall surface of the tube.

DEPR:

The plastic sheath 10 may incorporate therein an abrasive material. For example, a glass-filled nylon plastic material may be used, or pumice, silica, or some other fine abrasive material may be incorporated into the plastic. Other non-deleterious materials may also be incorporated into the plastic used for the plastic sheath, such as colorants or luminescent materials which would give the scraper a "glow-in-the-dark" appearance for easy locating.

US-PAT-NO: 5938493

DOCUMENT-IDENTIFIER: US 5938493 A

TITLE: Method for increasing field emission tip efficiency through micro-milling techniques

DATE-ISSUED: August 17, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Vickers; Kenneth G.	Whitesboro	TX	N/A	N/A

US-CL-CURRENT: 445/24,313/309 ,445/25 ,445/50

ABSTRACT:

A method of fabricating electron emission structures 30 having enhanced emission characteristics. The method comprising the steps of providing a substrate 10 having electron emission structures 5 thereon and having a gate layer 6 over the electron emission structures 5. Then modifying the electron emission structures with a focused beam to create modified electron emission structures 30 with enhanced emission efficiency.

10 Claims, 16 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 6

DATE FILED: December 18, 1996

----- KWIC -----

BSPR:

On a second substrate, facing the first, the display has regularly spaced, parallel conductive stripes comprising the anode electrode. The second substrate is also called the anode plate. These stripes are alternately covered by a first material luminescing in red, a second material luminescing in green, and a third material luminescing in blue, the conductive stripes covered by the same luminescent material being electrically interconnected.

BSPR:

The Clerc patent discloses a process for addressing a trichromatic field emission flat panel display. The process consists of successively raising each set of interconnected anode stripes periodically to a first potential which is sufficient to attract the electrons emitted by the microtips of the cathode conductors corresponding to the pixels which are to be illuminated in the color of the selected anode stripes. Those anode stripes which are not being selected are set to a potential such that the electrons emitted by the microtips are repelled or have an energy level below the threshold cathodoluminescence energy level of the luminescent materials covering those unselected anodes.

BSPR:

Anode plate 1 comprises a transparent, electrically conductive film 12 deposited on a transparent planar support 13, such as glass, which is

positioned facing gate electrode 6 and parallel thereto, the conductive film 12 being deposited on the surface of the glass support 13 directly facing gate electrode 6. Conductive film 12 may be in the form of a continuous layer across the surface of the glass support 13; alternatively, it may be in the form of electrically isolated stripes comprising three series of parallel conductive bands across the surface of the glass support 13, as shown in FIG. 1 and as taught in U.S. Pat. No. 5,225,820, to Clerc. By way of example, a suitable material for use as conductive film 12 may be indium-tin-oxide (ITO), which is substantially optically transparent and electrically conductive. Anode plate 1 also comprises a cathodoluminescent phosphor coating 3, deposited over conductive film 12 so as to be directly facing and immediately adjacent gate electrode 6. In the Clerc patent, the conductive bands of each series are covered with a particulate phosphor coating which luminesces in one of the three primary colors, red, blue and green, labeled 3.sub.R, 3.sub.B, 3.sub.G respectfully.

BSPR:

Selected groupings of microtip emitters 5 of the above-described structure are energized by applying a negative potential to cathode electrode 9 relative to the gate electrode 6, via voltage supply 15, thereby inducing an electric field which draws electrons from the apexes of microtips 5. The potential between cathode electrode 9 and gate electrode 6 is approximately 70-100 volts. The emitted electrons are accelerated toward the anode plate 1 which is positively biased by the application of a substantially larger positive voltage from voltage supply 11 coupled between the cathode electrode 9 and conductive film 12 functioning as the anode electrode. The potential between cathode electrode 9 and anode electrode 12 is approximately 300-1000 volts. Energy from the electrons attracted to the anode conductive film 12 is transferred to particles of the phosphor coating 3, resulting in luminescence. The electron charge is transferred from phosphor coating 3 to conductive film 12, completing the electrical circuit to voltage supply 11. Charge can also be transferred by secondary electron emission. The image created by the phosphor stripes is observed from the anode side which is opposite to the phosphor excitation, as indicated in FIG. 1.

DEPR:

Several other variations in the above processes, such as would be understood by one skilled in the art to which it pertains, are considered to be within the scope of the present invention. First, a hard mask, such as aluminum or gold, may replace the photoresist layers of the above described process. Next, more than one material may be evaporated to form the microtips. Also, the microtips may be comprised of other materials or combinations of materials, such as niobium coated with any low work function material. In addition, the lift-off layer and overburden material may be removed by other procedures well known in the art, such as sonic bath, water spray, or air gun. Next, the focused beam may be pulsed by any method such as a mechanical shutter, or by electrical defocusing.

US-PAT-NO: 5893562

DOCUMENT-IDENTIFIER: US 5893562 A

TITLE: Shooter and target water gun game

DATE-ISSUED: April 13, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Spector; Donald	Union City	NJ	07087	N/A

US-CL-CURRENT: 273/349,273/371

ABSTRACT:

A mock battle game for children in which each player in the role of a shooter is provided with a toy water gun which when triggered, projects a beam of water in the direction in which the gun is aimed. Each player who acts as a target wears a vest having at least one target zone that includes a water-sensor module housing a water-absorbent, non-conductive pad having embedded therein a pair of spaced electrodes. The pad is impregnated with salt crystals to form a resistance bridge between the electrodes which function as a normally open switch to connect a battery in the vest to an integrated circuit unit. When the switch is closed, the unit then generates a visible or audible signal. In the course of play when a shooter-player succeeds in striking the target zone on the vest of a target-player to wet the module therein, the salt crystals are then dissolved to produce a conducive salt solution that closes the switch, the resultant signal being indicative of a hit.

9 Claims, 5 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 2

DATE FILED: December 18, 1997

----- KWIC -----

TTL:

Shooter and target water gun game

ABPL:

A mock battle game for children in which each player in the role of a shooter is provided with a toy water gun which when triggered, projects a beam of water in the direction in which the gun is aimed. Each player who acts as a target wears a vest having at least one target zone that includes a water-sensor module housing a water-absorbent, non-conductive pad having embedded therein a pair of spaced electrodes. The pad is impregnated with salt crystals to form a resistance bridge between the electrodes which function as a normally open switch to connect a battery in the vest to an integrated circuit unit. When the switch is closed, the unit then generates a visible or audible signal. In the course of play when a shooter-player succeeds in striking the target zone on the vest of a target-player to wet the module therein, the salt crystals are then dissolved to produce a conducive salt solution that closes the switch, the resultant signal being indicative of a hit.

PCPR:

This application is a continuation-in-part of my application Ser. No. 08/874,519, filed Jun. 16, 1997 entitled "Toy Vehicle Having Laser Beam Turret Gun For Playing War Games," now abandoned whose entire disclosure is incorporated herein by reference.

BSPR:

This invention relates generally to shooter and target games for children, and more particularly to a game in which a shooter-player is provided with a water gun that when triggered projects a water beam in the direction in which the gun is aimed, and in which a target player wears a vest having a target zone therein which when struck and made wet by the water beam, then produces a switching action to activate a battery-powered unit which emits an audible or visible signal indicative of a hit.

BSPR:

In recent years, the usual toy weapon for playing shooter-target games has been a laser-beam gun, the shooter-player who holds this gun shooting out a simulated laser beam which he aims in the direction of a target worn by an opposing player. Thus the Scarlari et al. U.S. Pat. No. 4,586,715 discloses a toy laser pistol which includes a flash unit to generate, when the gun is triggered, a burst of high-intensity light. The light is collimated to produce a beam simulating a laser beam. A vest worn by a player who acts as the target is provided with a target area of fluorescent material. This material glows to indicate a hit when a light beam from the toy laser gun strikes the fluorescent target area.

BSPR:

The major drawback of a laser-beam toy gun is that the light beam projected therefrom when the gun is triggered is not visible under daylight conditions, thereby making it necessary to generate shooting sounds so that one is then aware that a beam is being projected. And when as in the Scarlari patent, this target is a fluorescent area, this area is ineffective in daylight hours when it is exposed to natural light, for the target is then always "on".

BSPR:

But the disadvantage of a water gun, even those currently available which are capable of projecting a water beam over a relatively long distance, is that when the beam strikes and wets a player there is nothing to then indicate that the target has been hit or where it has been hit other than the fact that the target is wet in the region struck by the water beam. But a wet target does not look very different from the same target when dry.

BSPR:

In view of the foregoing, the main object of this invention is to provide a mock battle game for children in which each player acting as a shooter is provided with a water gun which when triggered projects a beam of water in the direction in which the gun is aimed, and in which each player acting as a target wears a vest having a target zone that which when made wet by a beam impinging thereon activates a battery-powered integrated circuit unit producing a visual or audible signal indicative of a hit.

BSPR:

Briefly stated, these objects are attained by a mock battle game for children in which each player in the role of a shooter is provided with a toy water gun which when triggered, projects a beam of water in the direction in which the gun is aimed. Each player who acts as a target wears a vest having at least one target zone that includes a water-sensor module housing a water-absorbent, non-conductive pad having embedded therein a pair of spaced electrodes. The pad is impregnated with salt crystals to form a resistance bridge between the electrodes. The electrodes which function as a normally open switch connecting a battery in the vest to an integrated circuit unit.

DEPR:

Shooter-player 10 is armed with a toy water gun 12 having a trigger 13 which when pulled causes a beam 14 of water to be projected from the barrel 15 of the gun in the direction in which the gun is aimed. Mounted above the barrel of the gun is a replenishable bottled water reservoir 16 supplying water to the pump mechanism of the gun. In practice, all shooter-players participating in a mock battle game should be armed with identical water guns and thereby be put on an equal footing in the game.

DEPR:

Target-player 11 is shielded by a vest 17 formed of fabric or plastic sheeting that overlies the front side of the player's body to shield it from water emanating from a shooter-player's gun. Vest 17 is held in place by a pair of straps 18 and 19 forming loops that go over the shoulders of the player whose arms extend through the loops. In practice a player can be both a shooter and a target, hence a player wearing the vest is armed with a water gun.

DEPR:

In the course of play when a shooter-player 10 succeeds in aiming his gun so that the water beam 14 projected therein strikes target zone 20 on vest 17 worn by target-player 11, the module 21 within this zone is not made wet unless the beam impinges on the module. However, when the water beam strikes the target zone, the player holding the water gun can then scan the zone with the beam to impinge the beam on the module.

DEPR:

When there are say seven players participating in the game and each player is armed with a water gun, all other players are opponents and each player seeks to strike out the other players.

DEPR:

While there has been shown and described preferred embodiments of a shooter and target water gun game in accordance with the invention, it will be appreciated that many changes and modifications may be made therein without, however, departing from the essential spirit thereof.

CLPV:

A. a shooter-player provided with a water gun which when triggered projects a beam of water in the direction in which the gun is aimed;

US-PAT-NO: 5836799

DOCUMENT-IDENTIFIER: US 5836799 A

TITLE: Self-aligned method of micro-machining field emission display microtips

DATE-ISSUED: November 17, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Levine; Jules D.	Dallas	TX	N/A	N/A
Vickers; Kenneth G.	Whitesboro	TX	N/A	N/A

US-CL-CURRENT: 445/24,445/50

ABSTRACT:

A method of fabricating electron emission structures 28 having enhanced emission characteristics. The method comprises the steps of providing a substrate 10 having electron emission structures 5 thereon and having a layer 5" over the electron emission structures. The layer 5" having apertures 30 in alignment with said electron emission structures 5. Then modifying the electron emission structures 5 through the apertures 30 with a directional ion milling beam; thereby creating modified electron emission structures 17,29 with enhanced emission efficiency.

5 Claims, 9 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: December 6, 1996

----- KWIC -----

BSPR:

On a second substrate, facing the first, the display has regularly spaced, parallel conductive stripes comprising the anode electrode. The second substrate is also called the anode plate. These stripes are alternately covered by a first material luminescing in red, a second material luminescing in green, and a third material luminescing in blue, the conductive stripes covered by the same luminescent material being electrically interconnected.

BSPR:

The Clerc patent discloses a process for addressing a trichromatic field emission flat panel display. The process consists of successively raising each set of interconnected anode stripes periodically to a first potential which is sufficient to attract the electrons emitted by the microtips of the cathode conductors corresponding to the pixels which are to be illuminated in the color of the selected anode stripes. Those anode stripes which are not being selected are set to a potential such that the electrons emitted by the microtips are repelled or have an energy level below the threshold cathodoluminescence energy level of the luminescent materials covering those unselected anodes.

BSPR:

Anode plate 1 comprises a transparent, electrically conductive film 12 deposited on a transparent planar support 13, such as glass, which is positioned facing gate electrode 6 and parallel thereto, the conductive film 12 being deposited on the surface of the glass support 13 directly facing gate electrode 6. Conductive film 12 may be in the form of a continuous layer across the surface of the glass support 13; alternatively, it may be in the form of electrically isolated stripes comprising three series of parallel conductive bands across the surface of the glass support 13, as shown in FIG. 1 and as taught in U.S. Pat. No. 5,225,820, to Clerc. By way of example, a suitable material for use as conductive film 12 may be indium-tin-oxide (ITO), which is substantially optically transparent and electrically conductive. Anode plate 1 also comprises a cathodoluminescent phosphor coating 3, deposited over conductive film 12 so as to be directly facing and immediately adjacent gate electrode 6. In the Clerc patent, the conductive bands of each series are covered with a particulate phosphor coating which luminesces in one of the three primary colors, red, blue and green, labeled 3.sub.R, 3.sub.B, 3.sub.G respectfully.

BSPR:

Selected groupings of microtip emitters 5 of the above-described structure are energized by applying a negative potential to cathode electrode 9 relative to the gate electrode 6, via voltage supply 15, thereby inducing an electric field which draws electrons from the apexes of microtips 5. The potential between cathode electrode 9 and gate electrode 6 is approximately 70-100 volts. The emitted electrons are accelerated toward the anode plate 1 which is positively biased by the application of a substantially larger positive voltage from voltage supply 11 coupled between the cathode electrode 9 and conductive film 12 functioning as the anode electrode. The potential between cathode electrode 9 and anode electrode 12 is approximately 300-1000 volts. Energy from the electrons attracted to the anode conductive film 12 is transferred to particles of the phosphor coating 3, resulting in luminescence. The electron charge is transferred from phosphor coating 3 to conductive film 12, completing the electrical circuit to voltage supply 11. Charge can also be transferred by secondary electron emission. The image created by the phosphor stripes is observed from the anode side which is opposite to the phosphor excitation, as indicated in FIG. 1.

DEPR:

Several other variations in the above processes, such as would be understood by one skilled in the art to which it pertains, are considered to be within the scope of the present invention. First, a hard mask, such as aluminum or gold, may replace the photoresist layers of the above described process. Next, more than one material may be evaporated to form the microtips. Also, the microtips may be comprised of other materials or combinations of materials, such as niobium coated with any low work function material. In addition, the lift-off layer and overburden material may be removed by other procedures well known in the art, such as sonic bath, water spray, or air gun. Furthermore, overburden material which is shaped different than that described above can be used to create emitter structures of additional shapes.

US-PAT-NO: 5826879

DOCUMENT-IDENTIFIER: US 5826879 A

TITLE: Shooter and fabric target water gun game

DATE-ISSUED: October 27, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Spector; Donald	Union City	NJ	07087	N/A

US-CL-CURRENT: 273/349

ABSTRACT:

A mock battle game for children in which each player in the role of a shooter is provided with a toy water gun which projects when triggered, a beam of water in the direction in which the gun is aimed. Each player who acts as a target wears a T-shirt or a similar garment having an outer layer lined by an inner layer. The outer layer is formed of a normally opaque white fabric which when a portion thereof is made wet by the beam is then rendered translucent. The inner layer is formed by a red-colored fabric which when an overlying portion of the outer layer is rendered translucent then exhibits a blood-like effect to indicate a hit.

7 Claims, 5 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 1

DATE FILED: February 23, 1998

----- KWIC -----

TTL:

Shooter and fabric target water gun game

ABPL:

A mock battle game for children in which each player in the role of a shooter is provided with a toy water gun which projects when triggered, a beam of water in the direction in which the gun is aimed. Each player who acts as a target wears a T-shirt or a similar garment having an outer layer lined by an inner layer. The outer layer is formed of a normally opaque white fabric which when a portion thereof is made wet by the beam is then rendered translucent. The inner layer is formed by a red-colored fabric which when an overlying portion of the outer layer is rendered translucent then exhibits a blood-like effect to indicate a hit.

BSPR:

This invention relates generally to shooter and target games for children, and more particularly to a game in which a shooter player is provided with a water gun that projects when triggered a water beam in the direction in which the gun is aimed, and in which a target player wears a garment that when struck by the beam and a portion thereof made wet, the wet portion changes color to indicate a hit.

BSPR:

In recent years, the usual toy weapon for playing shooter-target games has been a laser-beam gun, the shooter player who holds this gun shooting out a simulated laser beam which he aims in the direction of a target worn by an opposing player. Thus the Scarlari et al. U.S. Pat. No. 4,586,715 discloses a toy laser pistol which includes a flash unit to generate, when the gun is triggered, a burst of high-intensity light. The light is collimated to produce a beam simulating a laser beam. A vest worn by a player who acts as the target is provided with a target area of fluorescent material. This material glows to indicate a hit when a light beam from the toy laser gun strikes the fluorescent target area.

BSPR:

Toy weapons which, when triggered, shoot out a water beam that can be aimed at an opposing player have obvious advantages over laser beam guns. With a water gun a player can in the daytime see the beam of water and also see when this beam strikes an opposing player and where he has hit the player.

BSPR:

But the disadvantage of a water gun, even those currently available which are capable of projecting a water beam over a relatively long distance, is that when the beam strikes a player there is nothing to then indicate that the target has been hit or where it has been hit other than the fact that the target is wet in the region struck by the water beam.

BSPR:

In view of the foregoing, the main object of this invention is to provide a shooter and target game for children in which a player acting as a shooter carries a water gun and the player acting as a target wears a garment which when struck by a beam of water projected from the gun then changes color in that portion of the garment that is rendered wet, thereby indicating a hit.

BSPR:

More particularly, an object of this invention is to provide a target player with a T-shirt which when dry is white and opaque and which when a portion of the shirt worn by the target player is made wet by a water beam from the gun of the shooter player, the wet portion then turns the color of blood to indicate a hit.

BSPR:

Briefly stated, these objects are attained by a mock battle game for children in which each player in the role of a shooter is provided with a water gun which projects when triggered, a beam of water in the direction in which the gun is aimed. Each player who acts as target wears a T-shirt or a similar garment having an outer layer lined by an inner layer.

DEPR:

Shooter-player 10 is provided with a water gun 12 which when triggered shoots out a pressurized water beam 13 that is projected in the direction in which the gun is aimed by player 10. Any commercially-available toy water gun is useable to play the game, preferably one capable of shooting out a beam for a

relatively long distance and including a replenishable bottled reservoir of water 14 supplying water to the pump of the gun. In practice, all players should be equipped with identical water guns and therefore be on an equal footing in the game.

DEPR:

Target player 11 wears a T-shirt 15 or a long-sleeve garment of the same material which when struck by water beam 13 then turns color in that portion of the garment made wet by the impinging beam to indicate a hit. In practice, each player on the game is both a shooter and a target, for each player not only wears a T-shirt 15 but he also carries a water gun 12.

DEPR:

While there has been shown and described a preferred embodiment of a shooter and target water gun game in accordance with the invention, it will be appreciated that many changes and modifications may be made therein without, however, departing from the essential spirit thereof.

CLPR:

2. A game as set forth in claim 1, in which the gun includes a water reservoir to supply water to a pump of the gun.

CLPV:

A. a shooter-player provided with a water gun which projects when triggered by the player a beam of water in a direction in which the gun is aimed; and

US-PAT-NO: 5780960

DOCUMENT-IDENTIFIER: US 5780960 A

TITLE: Micro-machined field emission microtips

DATE-ISSUED: July 14, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Vickers; Kenneth G.	Whitesboro	TX	N/A	N/A

US-CL-CURRENT: 313/310,313/351

ABSTRACT:

An electron emission apparatus comprising a gate emitter 6 formed as a conductive plate having an aperture 22 and an electron emitter structure 30 formed adjacent the aperture, the electron emission structure 30 having a void defining an emission surface.

7 Claims, 16 Drawing figures

Exemplary Claim Number: 7

Number of Drawing Sheets: 6

DATE FILED: December 18, 1996

----- KWIC -----

BSPR:

On a second substrate, facing the first, the display has regularly spaced, parallel conductive stripes comprising the anode electrode. The second substrate is also called the anode plate. These stripes are alternately covered by a first material luminescing in red, a second material luminescing in green, and a third material luminescing in blue, the conductive stripes covered by the same luminescent material being electrically interconnected.

BSPR:

The Clerc patent discloses a process for addressing a trichromatic field emission flat panel display. The process consists of successively raising each set of interconnected anode stripes periodically to a first potential which is sufficient to attract the electrons emitted by the microtips of the cathode conductors corresponding to the pixels which are to be illuminated in the color of the selected anode stripes. Those anode stripes which are not being selected are set to a potential such that the electrons emitted by the microtips are repelled or have an energy level below the threshold cathodoluminescence energy level of the luminescent materials covering those unselected anodes.

BSPR:

Anode plate 1 comprises a transparent, electrically conductive film 12 deposited on a transparent planar support 13, such as glass, which is positioned facing gate electrode 6 and parallel thereto, the conductive film 12 being deposited on the surface of the glass support 13 directly facing gate electrode 6. Conductive film 12 may be in the form of a continuous layer

across the surface of the glass support 13; alternatively, it may be in the form of electrically isolated stripes comprising three series of parallel conductive bands across the surface of the glass support 13, as shown in FIG. 1 and as taught in U.S. Pat. No. 5,225,820, to Clerc. By way of example, a suitable material for use as conductive film 12 may be indium-tin-oxide (ITO), which is substantially optically transparent and electrically conductive. Anode plate 1 also comprises a cathodoluminescent phosphor coating 3, deposited over conductive film 12 so as to be directly facing and immediately adjacent gate electrode 6. In the Clerc patent, the conductive bands of each series are covered with a particulate phosphor coating which luminesces in one of the three primary colors, red, blue and green, labeled 3.sub.R, 3.sub.B, 3.sub.G respectfully.

BSPR:

Selected groupings of microtip emitters 5 of the above-described structure are energized by applying a negative potential to cathode electrode 9 relative to the gate electrode 6, via voltage supply 15, thereby inducing an electric field which draws electrons from the apexes of microtips 5. The potential between cathode electrode 9 and gate electrode 6 is approximately 70-100 volts. The emitted electrons are accelerated toward the anode plate 1 which is positively biased by the application of a substantially larger positive voltage from voltage supply 11 coupled between the cathode electrode 9 and conductive film 12 functioning as the anode electrode. The potential between cathode electrode 9 and anode electrode 12 is approximately 300-1000 volts. Energy from the electrons attracted to the anode conductive film 12 is transferred to particles of the phosphor coating 3, resulting in luminescence. The electron charge is transferred from phosphor coating 3 to conductive film 12, completing the electrical circuit to voltage supply 11. Charge can also be transferred by secondary electron emission. The image created by the phosphor stripes is observed from the anode side which is opposite to the phosphor excitation, as indicated in FIG. 1.

DEPR:

Several other variations in the above processes, such as would be understood by one skilled in the art to which it pertains, are considered to be within the scope of the present invention. First, a hard mask, such as aluminum or gold, may replace the photoresist layers of the above described process. Next, more than one material may be evaporated to form the microtips. Also, the microtips may be comprised of other materials or combinations of materials, such as niobium coated with any low work function material. In addition, the lift-off layer and overburden material may be removed by other procedures well known in the art, such as sonic bath, water spray, or air gun. Next, the focused beam may be pulsed by any method such as a mechanical shutter, or by electrical defocusing.

US-PAT-NO: 5582879

DOCUMENT-IDENTIFIER: US 5582879 A

TITLE: Cluster beam deposition method for manufacturing thin film

DATE-ISSUED: December 10, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Fujimura; Hidehiko	Yokohama	N/A	N/A	JPX
Sawamura; Mitsuharu	Yokohama	N/A	N/A	JPX
Kameyama; Makoto	Funabashi	N/A	N/A	JPX
Yokoyama; Akihiko	Yokohama	N/A	N/A	JPX

US-CL-CURRENT: 427/561,427/109 ,427/126.1 ,427/126.3 ,427/166

ABSTRACT:

In a method of manufacturing a thin film, evaporated particles are generated by a vapor source and are clustered. The clustered evaporated particles are deposited onto a substrate in a vacuum atmosphere without ionizing the particles. A partial pressure of water in the vacuum atmosphere is controlled to not more than 5.times.10.sup.-6 Torr. A temperature of the substrate is maintained to be 150.degree. C. or lower. A film according to this method has a high adhesion characteristics and a high mechanical strength without heating the substrate to a high temperature and without damaging the substrate by ions.

6 Claims, 14 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 9

DATE FILED: November 4, 1994

----- KWIC -----

BSPR:

(5) means for ionizing and accelerating a reactive gas by glow discharge in a vacuum chamber (see Japanese Laid-Open Patent Application No. 63-011662);

DEPR:

For the purpose of comparison, when an 18-layered reflection film having the same structure as in this embodiment was prepared by heating a substrate to 300.degree. C. by an electron gun heating method, the examination results of the spectrum characteristics of the reflectivity of this film were as indicated by a curve A in FIGS. 11A and 11B, and the examination results of the spectrum characteristics of the reflectivity after the same laser durability test as described above were as indicated by a curve B in FIGS. 11A and 11B. As can be seen from FIGS. 11A and 11B, the center wavelength of the spectrum characteristics after the laser durability test is shifted by 5 nm toward the short wavelength side. More specifically, it is estimated that since a film manufactured by the electron gun heating method has a low packing, and water mixed in a thin film is removed from the thin film during the laser durability test, the refractive index was lowered.

US-PAT-NO: 5525085

DOCUMENT-IDENTIFIER: US 5525085 A

TITLE: Sparking toy vehicle and launcher therefore

DATE-ISSUED: June 11, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liu; Dexter C.	Portsmouth	RI	N/A	N/A

US-CL-CURRENT: 446/23,446/22 ,446/430

ABSTRACT:

A toy includes a toy vehicle, a launching assembly, and a rotatable sparking mechanism for generating sparks before the vehicle is launched from the launching assembly. In a preferred embodiment, the launching assembly includes a base track having a rack gear, and a push handle including a spring biased plunger. The sparking mechanism is mounted in the vehicle and a drive gear for sparking mechanism extends downwardly where it meshes with the rack gear when the vehicle is received on the base track. The push handle is slidably movable for advancing the vehicle along the base track wherein advancement of the vehicle causes rotation of the sparking mechanism thereby generating sparks, and further wherein a resistance of the sparking mechanism maintains the plunger in a depressed disposition until the drive gear disengages the rack gear.

3 Claims, 14 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 7

DATE FILED: September 22, 1995

----- KWIC -----

BSPR:

Sparking toy vehicles and launchers therefor have heretofore been known in the art. In this regard, the U.S. Pat. Nos. to Kennedy No. 4,479,326 and Kakizaki No. 4,571,212 represent the closest prior art to the subject matter of the instant invention of which the applicant is aware. The patent to Kennedy discloses a toy vehicle projecting gun assembly in which the vehicle is normally latched on an inclined ramp with the rear wheels raised and free to turn. Joined to the underside of the gun is a power trigger operated by the trigger finger of the operator. On the upper side of the gun is a firing button operated by the user's thumb. Actuation of the trigger drives a gear train which in turn drives a drive gear mounted on the rear wheel axle, the drive gear being coupled to a fly-wheel. The flywheel is energized by repeated trigger actions, whereupon the player presses the firing button which unlatches the vehicle which then shoots down the ramp. The patent to Kakizaki discloses a sparking toy vehicle which is driven by a fly-wheel capable of being energized by pulling a rack gear across a pinion which is connected to the fly wheel. One of the side surfaces of the flywheel is provided with a material, which when contact by a flint, is operative for producing sparks. The flint is

maintained in contact with the fly wheel surface by means of a spring-biased flint holder.

DEPR:

The first embodiment 10 comprises a toy vehicle generally indicated at 12, a launching assembly generally indicated at 14. The toy vehicle 12 is most clearly illustrated in FIG. 2 and it comprises a chassis 16, wheels 18 for rotatably supporting the chassis 16 on a supporting surface and a body generally indicated at 20. A rotatable sparking mechanism is mounted on the vehicle chassis 16 and it comprises an abrasive disc 22, a drive gear 24, a flint 26 and a spring 28 for biasing the flint 26 into engagement with the abrasive disc 22. The disc 22 and gear 24 are mounted on opposite ends of a shaft 30 which passes through the chassis 16 of the vehicle 12. The flint 26 and spring 28 are held within a flint holder 32 mounted on a block 34 on the chassis 16 adjacent the abrasive disc 22. Rotation of the drive gear 24 causes rotation of the disc 22 wherein the disc 22 and the flint 26 cooperate to generate sparks. The body 20 is preferably constructed from a translucent plastic so that the spark is visible to the user. The body 20 could alternatively comprise an opaque plastic and a colored windshield panel 36 so that the light from the sparks appears as a glow through the panel 36.

DEPR:

A second embodiment of the instant invention is illustrated and generally indicated at 58 in FIGS. 6-9. The second embodiment 58 comprises a vehicle generally indicated at 60, and a launching assembly generally indicated at 62. The vehicle 60 comprises a chassis (not shown), wheels 64 for rotatably supporting the chassis, and body a generally indicated at 66. The body 66 is constructed from an opaque plastic and it includes a colored windshield panel 68 so that the light from the sparks generated below the vehicle 60 appears as a tinted glow through the panel 68. Alternatively, the body 66 could be constructed from a translucent plastic. The launching assembly 62 comprises a base track generally indicated at 70 and a push handle generally indicated at 72. The base track 70 includes a supporting surface 74, bordering side walls 76 extending around three sides of the base track 70 and a inclined ramp 78 at one end thereof. The base track 70 further includes a rack gear 79 (FIG. 7) extending longitudinally along the length of the track 70.

DEPR:

A third embodiment of the invention is illustrated and generally indicated at 152 in FIGS. 10-14. The third embodiment 152 comprises a vehicle generally indicated at 154 and a launching assembly generally indicated at 156. The toy vehicle 154 is most clearly illustrated in FIG. 12 and it comprises a chassis 158, wheels 160 for rotatably supporting the chassis 158 on a supporting surface, and a body generally indicated at 162. A rotatable sparking mechanism is mounted on the vehicle chassis 158 and it comprises an abrasive disc 164, a drive gear 166, a flint 168 and a spring 170 for biasing the flint 168 into engagement with the abrasive disc 164. The disc 164 and gear 166 are mounted on a shaft 172 which is rotatably supported on the chassis 158 of the vehicle 154. The drive gear 166 extends downwardly through an aperture 174 in the chassis 158. The flint 168 and spring 170 are held within a flint holder 176 mounted on the chassis 158 adjacent the abrasive disc 164. Rotation of the drive gear 166 causes rotation of the disc 164 wherein the disc 164 and the

flint 168 cooperate to generate sparks. The body 162 includes a colored windshield panel 178 so that the light from the sparks appears as a tinted glow through the panel 178. Alternatively, the body 162 could be constructed from a translucent plastic.

US-PAT-NO: 5522752

DOCUMENT-IDENTIFIER: US 5522752 A

TITLE: Sparking toy vehicle and launcher therefor

DATE-ISSUED: June 4, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liu; Dexter C.	Portsmouth	RI	N/A	N/A

US-CL-CURRENT: 446/22,446/23 ,446/430

ABSTRACT:

A toy includes a toy vehicle, a launching assembly, and a rotatable sparking mechanism for generating sparks before the vehicle is launched from the launching assembly. In a preferred embodiment, the sparking mechanism is built into the push handle wherein advancement of the push handle along the base track causes rotation of a drive gear thereby generating sparks. The plunger is selectively maintained in a depressed position until the drive gear disengages from the rack gear.

2 Claims, 14 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 7

DATE FILED: September 22, 1995

----- KWIC -----

BSPR:

Sparking toy vehicles and launchers therefor have heretofore been known in the art. In this regard, the U.S. Pat. No. 4,479,326 to Kennedy and Kakizaki U.S. Pat. No. 4,571,212 represent the closest prior art to the subject matter of the instant invention of which the applicant is aware. The patent to Kennedy discloses a toy vehicle projecting gun assembly in which the vehicle is normally latched on an inclined ramp with the rear wheels raised and free to turn. Joined to the underside of the gun is a power trigger operated by the trigger finger of the operator. On the upper side of the gun is a firing button operated by the user's thumb. Actuation of the trigger drives a gear train which in turn drives a drive gear mounted on the rear wheel axle, the drive gear being coupled to a fly-wheel. The flywheel is energized by repeated trigger actions, whereupon the player presses the firing button which unlatches the vehicle which then shoots down the ramp. The patent to Kakizaki discloses a sparking toy vehicle which is driven by a fly-wheel capable of being energized by pulling a rack gear across a pinion which is connected to the fly wheel. One of the side surfaces of the flywheel is provided with a material, which when contact by a flint, is operative for producing sparks. The flint is maintained in contact with the fly wheel surface by means of a spring-biased flint holder.

DEPR:

The first embodiment 10 comprises a toy vehicle generally indicated at 12, a

launching assembly generally indicated at 14. The toy vehicle 12 is most clearly illustrated in FIG. 2 and it comprises a chassis 16, wheels 18 for rotatably supporting the chassis 16 on a supporting surface and a body generally indicated at 20. A rotatable sparking mechanism is mounted on the vehicle chassis 16 and it comprises an abrasive disc 22, a drive gear 24, a flint 26 and a spring 28 for biasing the flint 26 into engagement with the abrasive disc 22. The disc 22 and gear 24 are mounted on opposite ends of a shaft 30 which passes through the chassis 16 of the vehicle 12. The flint 26 and spring 28 are held within a flint holder 32 mounted on a block 34 on the chassis 16 adjacent the abrasive disc 22. Rotation of the drive gear 24 causes rotation of the disc 22 wherein the disc 22 and the flint 26 cooperate to generate sparks. The body 20 is preferably constructed from a translucent plastic so that the spark is visible to the user. The body 20 could alternatively comprise an opaque plastic and a colored windshield panel 36 so that the light from the sparks appears as a glow through the panel 36.

DEPR:

A second embodiment of the instant invention is illustrated and generally indicated at 58 in FIGS. 6-9. The second embodiment 58 comprises a vehicle generally indicated at 60, and a launching assembly generally indicated at 62. The vehicle 60 comprises a chassis (not shown), wheels 64 for rotatably supporting the chassis, and body a generally indicated at 66. The body 66 is constructed from an opaque plastic and it includes a colored windshield panel 68 so that the light from the sparks generated below the vehicle 60 appears as a tinted glow through the panel 68. Alternatively, the body 66 could be constructed from a translucent plastic. The launching assembly 62 comprises a base track generally indicated at 70 and a push handle generally indicated at 72. The base track 70 includes a supporting surface 74, bordering side walls 76 extending around three sides of the base track 70 and a inclined ramp 78 at one end thereof. The base track 70 further includes a rack gear 79 (FIG. 7) extending longitudinally along the length of the track 70.

DEPR:

A third embodiment of the invention is illustrated and generally indicated at 152 in FIGS. 10-14. The third embodiment 152 comprises a vehicle generally indicated at 154 and a launching assembly generally indicated at 156. The toy vehicle 154 is most clearly illustrated in FIG. 12 and it comprises a chassis 158, wheels 160 for rotatably supporting the chassis 158 on a supporting surface, and a body generally indicated at 162. A rotatable sparking mechanism is mounted on the vehicle chassis 158 and it comprises an abrasive disc 164, a drive gear 166, a flint 168 and a spring 170 for biasing the flint 168 into engagement with the abrasive disc 164. The disc 164 and gear 166 are mounted on a shaft 172 which is rotatably supported on the chassis 158 of the vehicle 154. The drive gear 166 extends downwardly through an aperture 174 in the chassis 158. The flint 168 and spring 170 are held within a flint holder 176 mounted on the chassis 158 adjacent the abrasive disc 164. Rotation of the drive gear 166 causes rotation of the disc 164 wherein the disc 164 and the flint 168 cooperate to generate sparks. The body 162 includes a colored windshield panel 178 so that the light from the sparks appears as a tinted glow through the panel 178. Alternatively, the body 162 could be constructed from a translucent plastic.

US-PAT-NO: 5460560

DOCUMENT-IDENTIFIER: US 5460560 A

TITLE: Sparking toy vehicle and launcher therefor

DATE-ISSUED: October 24, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liu; Dexter C.	Portsmouth	RI	N/A	N/A

US-CL-CURRENT: 446/23,446/429

ABSTRACT:

A toy includes a toy vehicle and a launching assembly for launching the vehicle. The vehicle includes a rotatable sparking mechanism and a drive gear for rotating the sparking mechanism. The launching assembly includes an inclined ramp for receiving the vehicle and a gear train having a drive gear extending upwardly through an aperture in the inclined ramp. The drive gear intermeshes with the vehicle drive gear when the vehicle is received on the ramp. The launching assembly further includes a plunger mounted for engagement with the rear of the vehicle when the vehicle is received on the ramp, and a spring for normally biasing the plunger to an extended position. The gear train is driven by a pivotable lever mounted on the shaft of an actuator gear. Pivoting of the lever rotates the drive gear thereby rotating the sparking mechanism to generate sparks. Pivoting of the lever also withdraws and releases the plunger mechanism to forcibly propel the vehicle off the launching assembly and across a supporting surface.

5 Claims, 14 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 7

DATE FILED: May 23, 1994

----- KWIC -----

BSPR:

Sparking toy vehicles and launchers therefor have heretofore been known in the art. In this regard, the U.S. Pat. Nos. to Kennedy 4,479,326 and Kakizaki 4,571,212 represent the closest prior art to the subject matter of the instant invention of which the applicant is aware. The patent to Kennedy discloses a toy vehicle projecting gun assembly in which the vehicle is normally latched on an inclined ramp with the rear wheels raised and free to turn. Joined to the underside of the gun is a power trigger operated by the trigger finger of the operator. On the upper side of the gun is a firing button operated by the user's thumb. Actuation of the trigger drives a gear train which in turn drives a drive gear mounted on the rear wheel axle, the drive gear being coupled to a fly-wheel. The fly-wheel is energized by repeated trigger actions, whereupon the player presses the firing button which unlatches the vehicle which then shoots down the ramp. The patent to Kakizaki discloses a sparking toy vehicle which is driven by a fly-wheel capable of being energized by pulling a rack gear across a pinion which is connected to the fly wheel.

One of the side surfaces of the flywheel is provided with a material, which when contact by a flint, is operative for producing sparks. The flint is maintained in contact with the fly wheel surface by means of a spring-biased flint holder.

DEPR:

The first embodiment 10 comprises a toy vehicle generally indicated at 12, a launching assembly generally indicated at 14. The toy vehicle 12 is most clearly illustrated in FIG. 2 and it comprises a chassis 16, wheels 18 for rotatably supporting the chassis 16 on a supporting surface and a body generally indicated at 20. A rotatable sparking mechanism is mounted on the vehicle chassis 16 and it comprises an abrasive disc 22, a drive gear 24, a flint 26 and a spring 28 for biasing the flint 26 into engagement with the abrasive disc 22. The disc 22 and gear 24 are mounted on opposite ends of a shaft 30 which passes through the chassis 16 of the vehicle 12. The flint 26 and spring 28 are held within a flint holder 32 mounted on a block 34 on the chassis 16 adjacent the abrasive disc 22. Rotation of the drive gear 24 causes rotation of the disc 22 wherein the disc 22 and the flint 26 cooperate to generate sparks. The body 20 is preferably constructed from a translucent plastic so that the spark is visible to the user. The body 20 could alternatively comprise an opaque plastic and a colored windshield panel 36 so that the light from the sparks appears as a glow through the panel 36.

DEPR:

A second embodiment of the instant invention is illustrated and generally indicated at 58 in FIGS. 6-9. The second embodiment 58 comprises a vehicle generally indicated at 60, and a launching assembly generally indicated at 62. The vehicle 60 comprises a chassis (not shown), wheels 64 for rotatably supporting the chassis, and body a generally indicated at 66. The body 66 is constructed from an opaque plastic and it includes a colored windshield panel 68 so that the light from the sparks generated below the vehicle 60 appears as a tinted glow through the panel 68. Alternatively, the body 66 could be constructed from a translucent plastic. The launching assembly 62 comprises a base track generally indicated at 70 and a push handle generally indicated at 72. The base track 70 includes a supporting surface 74, bordering side walls 76 extending around three sides of the base track 70 and a inclined ramp 78 at one end thereof. The base track 70 further includes a rack gear 79 (FIG. 7) extending longitudinally along the length of the track 70.

DEPR:

A third embodiment of the invention is illustrated and generally indicated at 152 in FIGS. 10-14. The third embodiment 152 comprises a vehicle generally indicated at 154 and a launching assembly generally indicated at 156. The toy vehicle 154 is most clearly illustrated in FIG. 12 and it comprises a chassis 158, wheels 160 for rotatably supporting the chassis 158 on a supporting surface, and a body generally indicated at 162. A rotatable sparking mechanism is mounted on the vehicle chassis 158 and it comprises an abrasive disc 164, a drive gear 166, a flint 168 and a spring 170 for biasing the flint 168 into engagement with the abrasive disc 164. The disc 164 and gear 166 are mounted on a shaft 172 which is rotatably supported on the chassis 158 of the vehicle 154. The drive gear 166 extends downwardly through an aperture 174 in the chassis 158. The flint 168 and spring 170 are held within a flint holder 176

mounted on the chassis 158 adjacent the abrasive disc 164. Rotation of the drive gear 166 causes rotation of the disc 164 wherein the disc 164 and the flint 168 cooperate to generate sparks. The body 162 is constructed from opaque plastic and it includes a colored windshield panel 178 so that the light from the sparks appears as a tinted glow through the panel 178. Alternatively, the body 162 could be constructed from a translucent plastic.

US-PAT-NO: 5415151

DOCUMENT-IDENTIFIER: US 5415151 A

TITLE: Phosphor-containing projectile and launcher therefor

DATE-ISSUED: May 16, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Fusi; John C.	New Providence	NJ	N/A	N/A
Gale; Eric H.	High Bridge	NJ	N/A	N/A

US-CL-CURRENT: 124/56,124/1 ,124/16 ,124/83 ,273/DIG.24 ,446/219 ,473/569 ,473/570

ABSTRACT:

The present invention encompasses a toy launcher, a phosphor-containing projectile and, in combination, a toy launcher and a phosphor-containing projectile. The launcher includes a mechanism for launching the phosphor-containing projectile outwardly from the launcher, and a radiation-emitter for exposing the projectile within the launcher to phosphorescence-activating radiation prior to the projectile leaving the launcher, whereby the projectile will phosphoresce as it leaves the launcher.

26 Claims, 11 Drawing figures

Exemplary Claim Number: 1,17

Number of Drawing Sheets: 3

DATE FILED: September 20, 1993

----- KWIC -----

BSPR:

The appeal to children and adults alike of an illuminated or glowing object traveling across a dark background (like a shooting star against the night) is well recognized by those in the toy art. Accordingly, a water gun sold under the trade name LUMINATOR utilizes a two-part chemiluminescent system wherein the two fluids are mixed by the gun just prior to ejection. A strong blue glow emanates from the resulting fluid mix, illuminating both the stream of fluid in the air and the target once the target is struck and thus wet by the fluid. Further, the TCR (TOTAL CONTROL RACING) line of the Ideal Toy Corporation included a road racing set with phosphorescent cars which intermittently pass through a black-light tunnel, thereby causing them to glow when they exited from the tunnel. Indeed, U.S. Pat. Nos. 2,629,516 and 4,239,129 disclose otherwise conventional water guns including a light source which emits a light beam to illuminate the stream of water issuing from the barrel. However, once the stream of water and the beam of light diverge, the liquid stream is no longer illuminated.

US-PAT-NO: 5270100

DOCUMENT-IDENTIFIER: US 5270100 A

TITLE: Phosphorescent coloring method

DATE-ISSUED: December 14, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Giglio; Anthony J.	Darien	CT	06820	N/A

US-CL-CURRENT: 428/195,250/459.1 ,250/462.1 ,40/542 ,427/157

ABSTRACT:

The present invention comprises an element and method for preparing phosphorescent colored indicia comprising providing a phosphorescent substrate; applying to said phosphorescent substrate a colored translucent media; exposing said colored phosphorescent substrate to excitation energy; and viewing said colored substrate and media in the dark.

14 Claims, 3 Drawing figures

Exemplary Claim Number: 8

Number of Drawing Sheets: 3

DATE FILED: February 5, 1992

----- KWIC -----

BSPR:

It has long been sought to create a phosphorescent or "glow-in-the-dark" crayon for use by children. Although greatly desired, the production of such a crayon has, to date, not been achieved. In addition, the production of phosphorescent fabrics, although also long sought, has yet to be attained.

BSPR:

What is needed, therefore, is a fluorescent element and method whereby drawings, paintings, colored writing and other markings or indicia can be viewed in the dark in glowing colors, in order to provide a new dimension and excitement to the enjoyment of the production of such drawings, paintings, and markings.

BSPR:

Gordon, in U.S. Pat. No. 2,460,221, discloses the use of a phosphorescent backing sheet to enable the viewing of shapes in the dark. To do so, a light blocking figure in the shape of the desired form is placed on the sheet prior to exposure to light. After exposure, the sheet is placed in the dark and the light blocking figure removed, resulting in a "shadow picture" in the desired shape, which appears because the phosphorescence activating light was blocked by the figure. Of course, it will be recognized that this absence of phosphorescence cannot duplicate the desired glowing colors of the present invention.

DEPR:

As illustrated in FIG. 2, substrate 20 can also assume various shapes, including for instance, the shape of a Christmas ornament which can be colored and then hung on a Christmas tree by conventional means, a toy such as a gun, car, or truck or an article like a bicycle or a sled (or any part thereof). In fact, substrate 20 can assume virtually any desirable shape for application wherever desired by the user. For example, phosphorescent coloring system 10 can be used for jewelry items, novelties, etc.

US-PAT-NO: 5229531

DOCUMENT-IDENTIFIER: US 5229531 A

TITLE: Toy cap gun with light transmitting, glow in the dark chamber

DATE-ISSUED: July 20, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Song; Myung	Gladwyne	PA	N/A	N/A

US-CL-CURRENT: 42/58,446/473

ABSTRACT:

The present invention is a toy cap gun, which includes a gun housing having a forward end and a rearward end, a chamber, a barrel, a cap anvil, a hammer and a trigger. The chamber is formed of material which permits light from a cap firing flash to be visible therethrough, and the chamber further contains an effective amount of a glow in the dark material. Further, the chamber is movably located within the housing and the chamber and housing together are adapted to load and unload caps. The barrel is located at a forward end of the housing and the chamber. There is a rotatable cap anvil which is located on a rearward end of the chamber, extending into the chamber and adapted to hold caps. The hammer is located on the housing, is connected to a trigger mechanism and is located adjacent to the cap anvil for intermittently striking and detonating caps. There is a trigger mechanism extending from the housing and functionally connected to the hammer for intermittently impacting the hammer to detonate caps.

14 Claims, 1 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 1

DATE FILED: August 3, 1992

----- KWIC -----

TTL:

Toy cap gun with light transmitting, glow in the dark chamber

ABPL:

The present invention is a toy cap gun, which includes a gun housing having a forward end and a rearward end, a chamber, a barrel, a cap anvil, a hammer and a trigger. The chamber is formed of material which permits light from a cap firing flash to be visible therethrough, and the chamber further contains an effective amount of a glow in the dark material. Further, the chamber is movably located within the housing and the chamber and housing together are adapted to load and unload caps. The barrel is located at a forward end of the housing and the chamber. There is a rotatable cap anvil which is located on a rearward end of the chamber, extending into the chamber and adapted to hold caps. The hammer is located on the housing, is connected to a trigger mechanism and is located adjacent to the cap anvil for intermittently striking and detonating caps. There is a trigger mechanism extending from the housing

and functionally connected to the hammer for intermittently impacting the hammer to detonate caps.

BSPR:

The present invention is directed to a toy cap gun, such as a pistol or rifle or other type of cap gun which contains cap firing capabilities. More specifically, it is directed to a toy cap gun having an at least partially transparent (translucent or transparent) chamber which has glow in the dark material of construction.

BSPR:

U.S. Pat. No. 4,598,491 describes a toy cap gun in which a chamber is used to produce a dramatic sound and light effect when the caps are detonated by creating proper acoustics and by providing for a transparent or translucent chamber. The present invention is directed to toy cap guns which are an improvement over and unobvious over the U.S. Pat. No. 4,598,491 toy cap guns because the present invention cap guns include glow in the dark material incorporated into the barrel. This creates a dramatic night-time effect by having the glow in the dark chamber attract the gun to the eye of the observer before the detonation of the cap occurs. Additionally, it enables children to easily locate the toy cap guns in the dark, whether outside or inside the home or in a closet or otherwise. Additionally, there is a synergistic effect between the glow in the dark chamber and the simultaneous "lightening" effect of the flash in the dark. The glow in the dark feature encourages the guns use in the dark yet, due to its glow in the dark nature, it safely locates the gun so that it is not accidentally fired close to the face or is not left in an unsafe area such as where a baby might accidentally fire it. Finally, in preferred embodiments, the chamber is translucent and the main housing of the cap gun is transparent and, upon firing in the dark, the glow in the dark chamber creates one effect, the flash within a chamber creates a second effect, and the back-lighting of the flash through the clear, transparent housing brilliantly lights up the cap gun to create a magnificent yet safe firing effect not achieved by the prior art.

BSPR:

The present invention is a toy cap gun, which includes a gun housing having a forward end and a rearward end, a chamber, a barrel, a cap anvil, a hammer and a trigger. The chamber is formed of material which permits light from a cap firing flash to be visible therethrough, and the chamber further contains an effective amount of a glow in the dark material. Further, the chamber is movably located within the housing and the chamber and housing together are adapted to load and unload caps. The barrel is located at a forward end of the housing and the chamber. There is a rotatable cap anvil which is located on a rearward end of the chamber, extending into the chamber and adapted to hold caps. The hammer is located on the housing, is connected to a trigger mechanism and is located adjacent to the cap anvil for intermittently striking and detonating caps. There is a trigger mechanism extending from the housing and functionally connected to the hammer for intermittently impacting the hammer to detonate caps.

DRPR:

FIG. 1 shows a side cut view of a preferred embodiment toy cap gun of the

present invention.

DEPR:

The present invention toy cap gun has the features of known cap guns but further includes a chamber which is formed of a glow in the dark material and is at least partially transparent, translucent or transparent. It is generally constructed of plastic but includes the necessary metal parts such as the hammer and anvil and, in some embodiments, metal springs.

DEPR:

In a preferred embodiment, the present invention toy cap gun has a housing which is transparent. This creates a synergistic effect in that, when the present invention toy cap gun is fired in the dark, the flash back-lighting causes the handle and working parts to be dramatically illuminated.

DEPR:

In another preferred embodiment of the present invention, the chamber is translucent, as well as made of glow in the dark material, and the main housing of the toy cap gun is transparent so that there is a three-fold light effect upon firing, namely, the glow in the dark initial illumination of the barrel, the conversion of the glow in the dark coloration to the yellowish-whitish lighting up of the translucent chamber, and, third, the bright "lightening" effect of the detonating cap flash lighting up the transparent housing.

DEPR:

In all embodiments of the present invention, the glow in the dark aspect of the barrel affords substantial advantages to the present invention toy gun. Not only does it enable a user to locate the toy gun in the dark, whether indoors or outdoors, and even in closets or other normally dark places such as basements or attics, but it also acts as an extra safety feature in that it would immediately show a mother that the cap gun had been accidentally or incorrectly placed near a sleeping baby, e.g. in a crib at night. Further, children playing in the dark would instinctively keep the guns away from their own faces and non-users would move away from the guns in the dark and avoid any flash sparks or other problems due to the glow in the dark feature.

DEPR:

The glow in the dark material which is incorporated within the construction of the chamber may be mixed in at the time of formation of the chamber or may be coated or otherwise applied to the chamber after it has been initially formed. In any case, the glow in the dark material may be any of the varieties of glow in the dark materials commercially available or which may become available. These would include any chemiluminescent material and would include fluorescent dyes, phosphorescent dyes, glow in the dark particles, day glow pigments and the like.

DEPR:

The Kirk-Othmer Encyclopedia of Chemical Technology (third addition, volume 6, page 612), indicates that fluorescent pigments or dyes depend upon their ability to absorb light at one wavelength and to emit it in a narrow intense band at a longer wavelength . . . the dyes used include the rhodamines, which emit pink, aminonaphthalimides which are bright greenish-yellow. To obtain the

maximum effect, the dyes are dissolved in brittle resins at low concentrations. Color resins are then ground to powders and used as pigments the brightness of such a combination far exceeds that of any pigment alone. It goes on to indicate that fluorescent dyes do not have light fastness and their use in plastics is confined to the lower temperature resins, vinyls, polyethylene, acrylics and the like. Further, at volume 14, pages 546 and 547, it is indicated that there are many types of luminescent materials, some of which require a special source of excitation such as an electric discharge or ultraviolet radiation. Daylight-fluorescent pigments, in contrast, require no artificially general energy. Daylight, or an equivalent white light can excite these unique materials not only to reflect colored lights selectively but to give off an extra glow of fluorescent light, often with high efficiency and surprising brilliance . . . Daylight-fluorescent pigments which are particles of colorless resins with few exceptions, and contain dye stuffs that not only have color but are capable of intense fluorescents in solution. The resin of construction may be a solvent for the dyes. For example, a thermo-plastic molten resin may be formed containing the dye and, upon cooling to room temperature, the resin mass becomes very brittle it may be pulverized to the proper fineness and added to other materials.

DEPR:

Manufacturers of fluorescent pigments, phosphorescent materials and other chemiluminescent materials offer varieties of products which may be used with most plastics used today for childrens' toys, containers and other consumer items. Typically, about one to two percent of the total weight of the plastic is added as a dry blended material or is first formulated into a color concentration pellet which is blended into colored resin before molding into a finished article. Thus, a chamber for the present invention may be formed which is transparent and substantially clear but contains particles of glow in the dark materials. Alternatively, there may be a sufficient number of particles which contain the glow in the dark material so as to render the chamber formed translucent rather than transparent or only partially transparent. Finally, the material formation of a present invention toy cap gun chamber may initially be translucent rather than transparent and additional glow in the dark material may be added thereto.

DEPR:

Referring now to FIG. 1, there is shown toy cap gun 1 having housing 3 with barrel 5, handle 7, and grip 9. Present invention toy cap gun 1 is shown in a side cut view and chamber 11 is either transparent, partially transparent or translucent. Its translucency should at least be adequate so that the light from the detonation of a cap will be transmitted therethrough, at least sufficiently for an observer to see the chamber "light up. " Housing 3 has a forward end 13 and a rearward end 15 as shown. Chamber 11 likewise has forward end 17 and a rearward end 19. At rearward end 19 is anvil means 21 for receiving a cap disc or a series of caps. Hammer 27 is movably connected to housing 3 and functionally connected to trigger 23 such that when trigger 23 is pulled, hammer 27 is moved back (is cocked) and then released to strike caps located adjacent to anvil means 21. In this particular embodiment, there is a shaft 29 which is supported by chamber support 31 to allow chamber 11 to rotate therein and, to advance with anvil means 21 just one cap space to position a next, unfired cap for being struck by hammer 27. Thus, when trigger 23 is

pulled, pawl 41 will advance anvil means 21 and chamber 11 at firing position and then trigger 23 will be released and fire a new cap. Ratchet 43 maintains the proper alignment of the anvil and the trigger. Release pivot rod 33 and release snap member 35 permit chamber 11 and anvil means 21 to be held in place, to be swung down for cap loading, and to be removed from cutaway area 37 of housing 3, as desired.

DEPR:

Housing 3 of toy cap gun 1 may be made of any material but is desirably made of plastic and is preferably made of clear, transparent plastic. It may be partially transparent or translucent, but significant transparency enhances the lighting up effect during firing at night.

DEPR:

Chamber 11, is, as mentioned, partially transparent, translucent or transparent. In one preferred embodiment, it is translucent. In another preferred embodiment, it is translucent with the housing of the toy cap gun being transparent, to achieve maximum light effects.

DEPR:

The actual loading and unloading of the caps in a present invention toy cap gun will generally be the same as is used with conventional cap guns and need not be described herein in great detail as it is well within the purview of the artisan. Likewise, while cap discs such as disc 39 are used in this embodiment, the caps could be coming from a rolled paper strip, a straight plastic strip, or otherwise, without exceeding the scope of the present invention.

CLPR:

1. A toy cap gun, which comprises:

CLPR:

2. The toy cap gun of claim 1, wherein said chamber is at least partially transparent.

CLPR:

3. The toy cap gun of claim 1, wherein said chamber is translucent.

CLPR:

4. The toy cap gun of claim 1, wherein said chamber is transparent.

CLPR:

5. The toy cap gun of claim 1, wherein said glow in the dark material is chemiluminescent material.

CLPR:

6. The toy cap gun of claim 1, wherein said glow in the dark material is phosphorescent material.

CLPR:

7. The toy cap gun of claim 1, wherein said housing is transparent.

CLPR:

8. The toy cap gun of claim 2, wherein said housing is transparent.

CLPR:

9. The toy cap gun of claim 3, wherein said housing is transparent.

CLPR:

10. The toy cap gun of claim 4, where said housing is transparent.

CLPR:

11. The toy cap gun of claim 5, wherein said housing is transparent.

CLPR:

12. The toy cap gun of claim 6, wherein said housing is transparent.

CLPR:

13. The toy cap gun of claim 1, further comprising means for releasably removably attaching said chamber to said housing.

CLPR:

14. The toy cap gun of claim 1, wherein chamber and anvil means are adapted to receive cap discs.

CLPV:

(b) a chamber being formed of material which permits light from a cap firing flash to be visible therethrough, said chamber further containing an effective amount of a glow in the dark material, said chamber being movably located within said housing and said chamber and housing together being adapted to load and unload caps;

US-PAT-NO: 5213335

DOCUMENT-IDENTIFIER: US 5213335 A

TITLE: Optical device and beam gun device using this optical device

DATE-ISSUED: May 25, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dote; Shingo	Kawasaki	N/A	N/A	JPX
Nishimura; Tatsuya	Tokyo	N/A	N/A	JPX

US-CL-CURRENT: 463/51,434/21 ,463/53

ABSTRACT:

An optical assembly is provided to simulate the emission of a light beam such as a laser, so that it appears to extend a considerable distance from the observer. The optical device can be advantageously integrated with a video game system or a simulated gun, and includes an arrangement of reflecting and semitransparent mirrors that can define a field of view, for example, of a target area, and can superimpose images of a light emitting unit so that a light beam can apparently extend to a target while maintaining a compact configuration.

20 Claims, 12 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 9

DATE FILED: March 8, 1991

----- KWIC -----

DRPR:

FIG. 6 is a side elevation showing an embodiment in which the present invention is applied to a bazooka beam gun toy;

DRPR:

FIG. 7 is a side elevation showing an embodiment in which the present invention is applied to a laser beam gun toy;

DRPR:

FIG. 11A is a side elevation showing an embodiment in which the present invention is applied to a bazooka laser gun toy;

DRPR:

FIG. 11B is a side elevational view of a bazooka laser gun toy housing; and

DEPR:

The entire mid-bottom surface 9 serves as an image display plane of a liquid crystal monitor or a CRT, whereby a shape of the simulation laser beam can arbitrarily be changed. Oblique linear luminescence can give a laser beam like a flash of lightning. An applicable range is thus widened.

DEPR:

FIG. 6 is a side elevation of a laser beam gun toy of a bazooka type, showing still another embodiment. The laser gun toy is arranged as follows. A gun barrel incorporates two half-mirrors 32 disposed in parallel to confront each other. A light emitting body 33 serving as a linear light source extends along the lower surface between the half-mirrors 32. The shooter peers into the gun barrel and sees through the two half-mirrors 32. The shooter aims a muzzle 34 at the target and then depresses an emission trigger 35. A battery 36 supplies the electric power to a light emitting body instantaneous lighting/firing sound generating circuit 37, thereby emitting the simulation laser beam. This toy is thus constructed.

DEPR:

Turning to FIG. 7, there is shown another embodiment of the laser beam gun toy.

DEPR:

In this embodiment, the gun toy includes a gun unit 38 made of a transport plastic resin which extends from the center thereof to the top end thereof. When pushing an emission trigger 39, a light emitting body 40 flashes within from the center thereof to the top end thereof.

DEPR:

Based on this structure of the scope 41, when the shooter pushes the trigger 39 while peering into the scope 41, the simulation laser beam flashes inside the gun unit 38. Flashing of the light emitting body 40 is led to the portion between the half-mirrors 42 of the scope 41 and reflected therefrom, the portion being closely fitted to the gun unit 38. The laser beam looks as if it is emitted behind the scene viewed via the scope 41. A person, who is watching the beam gun toy from outside, is able to visually recognize firing of the beam gun toy because of flashing of the gun unit 38.

DEPR:

FIGS. 11A and 11B are side elevation views illustrating a bazooka laser beam gun toy. A scope 130 of the gun barrel incorporates a half-mirror 131 obliquely attached. A reflection mirror 132 is likewise tilted under the half-mirror 131. A convex lens 133 is positioned in front of the reflection mirror 132. A group of light emitting bodies 134 which are independently capable of flashing are disposed in front of the convex lens 133.

US-PAT-NO: 5168671

DOCUMENT-IDENTIFIER: US 5168671 A

TITLE: Dressing method and apparatus for super abrasive grinding wheel

DATE-ISSUED: December 8, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kataoka; Shigeaki	Shizuoka	N/A	N/A	JPX
Kobayashi; Shigeharu	Yokohama	N/A	N/A	JPX
Yagishita; Fukuzo	Shizuoka	N/A	N/A	JPX

US-CL-CURRENT: 451/36,125/11.01 ,451/38 ,451/444 ,451/56

ABSTRACT:

A method and apparatus for removing clogging material from between abrasive grains of a grinding wheel. A pressurized blasting fluid is supplied to a blasting gun, which in turn sucks an abrasive particle-liquid slurry into the gun. The slurry is entraining in the stream of blasting fluid, causing the liquid to be broken down into mist particles, and the resultant stream is discharged against the surface of the grinding wheel at a pressure in the range of 2.0 to 3.5 kg/cm.^{sup.2}.

6 Claims, 13 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 5

DATE FILED: February 10, 1992

----- KWIC -----

BSPR:

For grinding ceramic materials, various types of super abrasive grinding wheels bonded by different kinds of materials are used. In this grinding operation, clogging glows between wheel grains on the peripheral surface of the grinding wheel. Cutting action of the grains is reduced by the presence of removed stock between the grains, and the cutting edges of wheel grains are almost covered by removed stock. This is called clogging.

DEPR:

In the above apparatus, the pressure intensifier 18 delivers pressurized liquid (usually water) at about 30 kgf./cm.cm. pressure. The pressurized water is sent to the blasting gun 11 and is ejected from the blasting nozzle 24. Slurry is sucked through the connecting tube by vacuum created in slurry chamber 15, as described above relative to the apparatus of FIG. 1. The volume ratio of solid particles is maintained at 10% or less relative to the total slurry volume.

US-PAT-NO: 5151308

DOCUMENT-IDENTIFIER: US 5151308 A

TITLE: High density thermal spray coating

DATE-ISSUED: September 29, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Moskowitz; Larry N.	Naperville	IL	N/A	N/A
Lindley; Donald J.	Naperville	IL	N/A	N/A

US-CL-CURRENT: 428/35.8,105/360 ,220/1.5 ,220/62.11 ,220/917 ,220/DIG.24
,280/830 ,280/838 ,428/36.9 ,428/457 ,428/615 ,428/616 ,428/617 ,428/618
,428/619

ABSTRACT:

A high density, substantially oxide-free metal layer is deposited by spray deposition on a substrate in an atmosphere containing ambient air having an oxygen content above about 0.1% by weight. This is accomplished by directing a supersonic-velocity jet stream of hot gases carrying metal particles at the substrate through an inert gas shroud. The layer is useful as a corrosion barrier and for repairing metal substrates.

5 Claims, 8 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 4

DATE FILED: November 5, 1990

----- KWIC -----

DRPR:

FIG. 3 is a schematic illustration of a supersonic flame spray gun assembled with a modified water-cooled shroud apparatus according to this invention; and

DEPR:

A glow plug ignitor 50 preferably extends through the cylindrical wall of the constraining tube 40 for igniting the combustion gases employed in the flame spray gun. Alternatively, the glow plug 50 may be located in the cylindrical hub portion 21 of the manifold means 11. Utilization of the glow plug enhances operational safety of the spray gun.

US-PAT-NO: 5120567

DOCUMENT-IDENTIFIER: US 5120567 A

TITLE: Low frequency plasma spray method in which a stable plasma is created by operating a spray gun at less than 1 MHz in a mixture of argon and helium gas

DATE-ISSUED: June 9, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Frind; Gerhard	Altamont	NY	N/A	N/A
Siemers; Paul A.	Clifton Park	NY	N/A	N/A
Rutkowski; Stephen F.	Duanesburg	NY	N/A	N/A

US-CL-CURRENT: 427/576,219/121.38 ,427/422

ABSTRACT:

A low frequency RF plasma spray deposition method is provided, which is especially effective in reducing losses and improving particle heating. In one aspect of the invention, an RF plasma gun is operated in the frequency range below 1 MHz and an argon-helium mixture to which a third component, such as hydrogen, can also be admixed, is substituted for the standard argon-hydrogen mixture used at frequencies above 2 MHz. In another aspect of the invention, a RF plasma gun is operated in the frequency range of 400-500 kHz and specific start up and operating procedures and conditions are set forth for successful deposition of titanium and refractory metal alloys.

10 Claims, 4 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: May 17, 1990

----- KWIC -----

DEPR:

Tank 12 is provided with a gun-mounting vessel 26, usually of cylindrical configuration, which projects into the vacuum tank through a vacuum sealed orifice. The plasma gun is connected to a RF power supply 32 by leads 34 and 36. The plasma gun is usually provided with a coolant, usually water, supplied by a coolant circuit, not shown.

DEPR:

At 2 MHz the gun can be started at atmospheric pressure if only argon gas is used. At 400 kHz it was learned that ignition was easier at low pressures, but at pressures in the 10 torr range a glow type discharge would be initiated which could damage the fused silica tube wall. It has been found that ignition at 20-50 torr is optimum. The pressure is sufficiently low to allow easy ignition of argon, but sufficiently high to prevent generation of a glow type discharge.

US-PAT-NO: 5019429

DOCUMENT-IDENTIFIER: US 5019429 A

TITLE: High density thermal spray coating and process

DATE-ISSUED: May 28, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Moskowitz; Larry N.	Naperville	IL	N/A	N/A
Lindley; Donald J.	Naperville	IL	N/A	N/A

US-CL-CURRENT: 427/422,427/455

ABSTRACT:

A high density, substantially oxide-free metal layer is deposited by spray deposition on a substrate in an atmosphere containing ambient air having an oxygen content above about 0.1% by weight. This is accomplished by directing a supersonic-velocity jet stream of hot gases carrying metal particles at the substrate through an inert gas shroud. The layer is useful as a corrosion barrier and for repairing metal substrates.

9 Claims, 8 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 4

DATE FILED: August 11, 1989

----- KWIC -----

DRPR:

FIG. 3 is a schematic illustration of a supersonic flame spray gun assembled with a modified water-cooled shroud apparatus according to this invention; and

DEPR:

A glow plug ignitor 50 preferably extends through the cylindrical wall of the constraining tube 40 for igniting the combustion gases employed in the flame spray gun. Alternatively, the glow plug 50 may be located in the cylindrical hub portion 21 of the manifold means 11. Utilization of the glow plug enhances operational safety of the spray gun.

US-PAT-NO: 5017827

DOCUMENT-IDENTIFIER: US 5017827 A

TITLE: Compactly built electron tube and fabrication method thereof

DATE-ISSUED: May 21, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rossini; Umberto	Saint Egreve	N/A	N/A	FRX
Simonin; Pierre	Meylan	N/A	N/A	FRX
Tremblay; Christine	Voreppe	N/A	N/A	FRX

US-CL-CURRENT: 313/268,313/289 ,313/456 ,445/34 ,445/45

ABSTRACT:

The disclosure concerns electron tubes. A tube such as a cathode-ray tube consists of several parts, namely the stem, the neck, the cone and the screen of the front face. To build a tube such as this more compactly while, at the same time, improving the quality of the fabrication, a new construction of the neck is proposed. In the prior art, the neck is a glass tube to which there is soldered a glass stem through which pass the connection terminals towards the various electrodes, internal to the tube. Here, the neck is built in the form of a stack of alternating metallic rings and ceramic rings. The metallic rings are used for the supporting of and electrical connection to the internal electrodes. The ceramic rings are used to insulate the metallic rings. The brazings between metallic rings and ceramic rings provide for vacuum tightness. The base of the tube is a ceramic washer without drillings other than lateral ones for the connections to pass through. The connections are made chiefly around the neck on the metallic rings.

9 Claims, 2 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 2

DATE FILED: October 23, 1989

----- KWIC -----

BSPR:

For a clear understanding of the invention, we shall give a more precise description of its application to a cathode-ray tube, namely a tube comprising, firstly, an electron gun producing an electron beam and, secondly, a luminescent screen reacting to the impact of the beam to produce a light image.

BSPR:

the screen or front face of the tube, forming the luminescent screen on to which the electron beam is directed;

BSPR:

Finally, an aim of the invention is to prevent any chemical pollution of certain sensitive elements such as the screen of the tube or the cathode of the electron gun by products such as water vapor or other elements resulting from

combustion in a torch used to solder or heat certain parts of the tube.

US-PAT-NO: 4985186

DOCUMENT-IDENTIFIER: US 4985186 A

TITLE: Process for producing optical element

DATE-ISSUED: January 15, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nose; Noriyuki	Sagamihara	N/A	N/A	JPX
Nakajima; Toshiyuki	Atsugi	N/A	N/A	JPX
Kawakami; Eigo	Atsugi	N/A	N/A	JPX
Baba; Takeshi	Atsugi	N/A	N/A	JPX
Kushibiki; Nobuo	Ebina	N/A	N/A	JPX
Matsugu; Masakazu	Atsugi	N/A	N/A	JPX
Niwa; Yukichi	Atsugi	N/A	N/A	JPX

US-CL-CURRENT: 264/1.7,264/1.1 ,264/101 ,264/2.3 ,264/316 ,264/335 ,425/437 ,425/808

ABSTRACT:

A process for producing an optical element wherein an optical molding is formed by using a mold and thereafter released from the mold by supplying a gas to the boundary between the mold surface and the optical molding. In the process, no localized external force is applied to the optical molding during the release thereof, and therefore undesirable deformation or flaws of the optical molding are not caused.

15 Claims, 27 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 7

DATE FILED: April 8, 1987

----- KWIC -----

BSPR:

Such conventional methods include: one wherein a V-shaped wedge is driven into a boundary between an optical molding and a method; one wherein a closely contacting combination of an optical molding and a mold is cooled by a blow of air, e.g., by means of an air gun, or the combination is dipped into hot water and cold water alternately, so as to change the temperature of the combination whereby the optical molding is released from the mold because of a difference in expansion or shrinkage therebetween; or one wherein an ultrasonic vibration is applied to an optical molding or a mold thereby to cause a release.

DEPR:

It is more preferred that the surface of the film capable of contacting the elastomeric member 5 is preliminarily treated so as to improve the releasability thereof against the elastomeric member 5. Such treatment may include, for example, corona discharge treatment, glow discharge treatment, and a treatment using acid or base.

US-PAT-NO: 4943460

DOCUMENT-IDENTIFIER: US 4943460 A

TITLE: Process for coating polymer surfaces and coated products produced using such process

DATE-ISSUED: July 24, 1990

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Markle; Richard A.	Columbus	OH	N/A	N/A
Brusky; Phyllis L.	Columbus	OH	N/A	N/A
Baker; John H.	Strasburg	OH	N/A	N/A

US-CL-CURRENT: 428/36.9,428/353 ,428/451 ,428/522 ,523/112 ,524/266 ,524/267 ,525/102 ,604/265

ABSTRACT:

Processes for treating polymeric surfaces to produce smooth, durable, slippery coatings which are able to withstand the rigors of sterilization and, long term exposure to human blood and other bodily fluids without substantial loss of their slipperiness.

16 Claims, 0 Drawing figures

Exemplary Claim Number: 1

DATE FILED: February 13, 1989

----- KWIC -----

BSPV:

U.S. Pat. No. 4,312,575 also discloses contact lenses having an ultrathin, clear, lipid-permeable hydrophilic barrier coating which is formed by an electrical glow discharge process.

DEPR:

Also after this wet coating is dried with a hot air gun and placed in water, the clear surface becomes wet and slippery but quickly turns white and opaque. This is an unpleasing effect aesthetically. If the coating is dried at room temperature or at a relatively low temperature in an oven (e.g. 80.degree. C. for 15 or 30 minutes), the wet coating is readily removed when rubbed between the fingers under water, while the surface becomes cloudy. If a methanol solution of PVP (4 percent) is used to coat the PVC, even when the tubing is dipped for 100 seconds, and dried at 80.degree. C. for 30 minutes, the coating quickly dissolves and is removed with mild finger abrasion under water, yielding a non-slippery tubing.

US-PAT-NO: 4869936

DOCUMENT-IDENTIFIER: US 4869936 A

TITLE: Apparatus and process for producing high density thermal spray coatings

DATE-ISSUED: September 26, 1989

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Moskowitz; Larry N.	Naperville	IL	N/A	N/A
Lindley; Donald J.	Naperville	IL	N/A	N/A

US-CL-CURRENT: 427/455,118/47 ,239/290 ,239/296 ,239/405 ,239/79 ,239/81 ,239/85

ABSTRACT:

An attachment for supersonic thermal spray equipment by which inert shield gas is directed radially outwardly about the central core of a supersonic, particle-carrying flame to isolate the same from ambient atmosphere. The shield gas is injected tangentially against the inner surface of a constraining tube attached to and extending from the discharge end of the thermal spray gun nozzle, causing the shield gas to assume a helical flow path which persists until after it exits the tube and impacts the work piece. A process using the shielding apparatus with a high-velocity, thermal spray gun and employing oxygen and hydrogen as gases of combustion and inert gas to introduce metal powder, having a narrow particle size distribution and low oxygen content, into the high-velocity combustion gases, produces significantly improved, high-density, low-oxide metal coatings on a substrate.

26 Claims, 8 Drawing figures

Exemplary Claim Number: 13

Number of Drawing Sheets: 4

DATE FILED: December 28, 1987

----- KWIC -----

DRPR:

FIG. 3 is a schematic illustration of a supersonic flame spray gun assembled with a modified water-cooled shroud apparatus according to this invention; and

DEPR:

A glow plug ignitor 50 preferably extends through the cylindrical wall of the constraining tube 40 for igniting the combustion gases employed in the flame spray gun. Alternatively the glow plug 50 may be located in the cylindrical hub portion 21 of the manifold means 11. Utilization of the glow plug enhances operational safety of the spray gun.

CLPR:

10. The apparatus of claim 7 and glow plug means mounted on said shroud means for igniting gases of combustion for said spray gun.

US-PAT-NO: 4641316

DOCUMENT-IDENTIFIER: US 4641316 A

TITLE: D.C. electron beam method and apparatus for continuous laser excitation

DATE-ISSUED: February 3, 1987

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Collins; George J.	Ft. Collins	CO	N/A	N/A
Rocca; Jorge J.	Ft. Collins	CO	N/A	N/A
Meyer; Jack D.	Ft. Collins	CO	N/A	N/A

US-CL-CURRENT: 372/74,372/37 ,372/76 ,372/85 ,372/87

ABSTRACT:

A highly efficient laser employs a glow discharge electron gun and includes a solid wall cathode that emits a beam of electrons resulting in a plasma that is a negative glow discharge having an electron distribution that has a larger number of high energy electrons than would be present in a Maxwellian distribution of the same electron density.

12 Claims, 10 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: October 1, 1984

----- KWIC -----

ABPL:

A highly efficient laser employs a glow discharge electron gun and includes a solid wall cathode that emits a beam of electrons resulting in a plasma that is a negative glow discharge having an electron distribution that has a larger number of high energy electrons than would be present in a Maxwellian distribution of the same electron density.

BSPR:

Applicants use d.c. electron beams to excite plasmas that are used as active mediums for CW lasers. The plasmas are produced either by using high voltage (0.5 kV to 50 kV) electron beams produced by glow discharge electron guns, in a longitudinal (parallel to the optical axis), or in a transverse configuration, or by using low voltage (80 V to 500 V) electron beams in a transverse configuration. The electron beam ionizes and excites a gas or a metal vapor or a mixture of both and produces a population inversion. On Applicants' high voltage electron beam excitation use, the d.c. electron beam are produced by a glow discharge, solid wall electron gun, operating at pressures between 0.05 and 5 torr in a helium atmosphere one of several gases, without the need of differential pumping. When we use longitudinal electron beam excitation, an axial magnetic field of strength of 0.5 to 5 Kgauss is used to collimate the electron beam and efficiently deposit the electron beam energy into the plasma. We also use our high voltage glow discharge electron guns in a transverse excitation configuration. In this case pairs of opposite guns maintain the

beam confined to a limited volume, and in this way the electron beam energy is efficiently deposited into the laser active medium.

BSPR:

Another configuration Applicants use to excite CW lasers by electron beams, employs a low voltage electron beam in a transverse configuration with the electron beam traveling perpendicular to the optical axis. The low voltage electron beam in this latter case is produced by an electron gun that uses either a thermoionic emitting cathode, or a glow discharge cathode. This last configuration is particularly useful for the excitation of CW noble gas ion lasers and can increase the efficiency of these lasers due to the fact that the electron beam energy perfectly matches the peaks of the cross sections for excitation of the laser upper levels.

DEPR:

We describe and claim three configurations, as ways to achieve our novel method of d.c. electron beam pumping of CW lasers. These are: the use of our high voltage (0.5 to 50 kV) electron beams, created by our novel glow discharge electron solid gun, used longitudinally as in FIGS. 1, 2, 3 and 4; next, by the transverse use of our said electron beams, as in FIGS. 6 and 7; and thirdly the use of low voltage (80 to 500 V) electron beams in a transverse or perpendicular configuration to the laser optical axis, as in FIGS. 8, 9 and 10. We describe four modifications of our said first or longitudinal configuration. Our said first configuration, in which a high voltage electron beam is created by our novel glow discharge solid electron gun to longitudinally excite a CW laser, we describe first, being of FIGS. 1, 2, 3 and 4.

DEPR:

We use our novel electron gun, 31, suitably water cooled, with that cooling as diagrammatically shown in FIG. 5. In that housing 33, of FIGS. 1-4, we have the mixture of helium and oxygen, but without any metal vapor in 33. Suitable electrical ground and negative high voltage wiring connections are supplied in each of our FIGS. 1-4 modifications, as diagrammatically shown.

DEPR:

In gun 31 housing 33, we provide a gas inlet 30, wherein we bring a controlled small amount of oxygen into our electron gun housing 33 for operation of our electron gun 31. We have discovered that our said glow discharge electron gun 31 operates best in the presence of a small amount of oxygen within its housing 33, along with the presence of some helium there. Such oxygen entering at 33 does not go into the tube 10, but only creates an environment in its electron gun 33 housing, for better performance of electron beam emission at the outer 31a end face surface of our electron gun 31, according to its design, as explained, and will be further.

DEPR:

Our d.c. glow discharge electron solid gun 31 produces a well collimated electron beam, of an energy between 0.5 and 50 keV and a current between 50 ma and a few amperes. Our gun 31 can operate at pressures from 50 mtorr to 4 torr without the need of differential pumping. These discharge parameters make our electron gun especially suitable for pumping CW ion lasers.

DEPR:

Ions coming from the electron beam sustained plasma bombard our cathode surface, of 1 outer surface 31a and produce secondary electrons. These electrons are accelerated in the cathode fall region, where most of the voltage drop in the glow discharge occurs. We shield the cathode by a ceramic, glass, quartz or metal tube 31b on all sides of 31 except its face, to restrict electron emission to the cathode front face 31a. The cathode front face 31a is formed concave, to thereby produce a well collimated self-focusing electron beam therefrom, on electron beam shooting from that face. Electron gun 31 is water cooled as shown in detail in FIG. 5, to operate at a discharge power of many kilowatts in a true d.c. way.

DEPR:

We show another use of our direct current gun 31 created electron beam for CW laser excitation in FIG. 3. In this FIG. 3 our gun has no opening tube 5, and in this modification the position of our electron gun 31 is not coaxial to the plasma tube 10, as before in FIGS. 1 and 2, but is placed out of that tube axis. However the electron beam generated by our solid glow discharge electron gun 31 is still shot from 31a outer surface gun end into the plasma tube by means of deflecting the electron beam by a conventional magnetic coil 60, as shown. In this case the electron gun used does not need to have a hole through its axis face, as not necessary here for a hole to match the volume of electron beam to the plasma to the volume of the optical resonator. By placing the gun of FIG. 3 modification out of alignment with the axis of the plasma tube we provide a clear optical path between 40-41 and we match the tube plasma volume to the volume of the two tube 10 and dielectric mirrors.

DEPR:

We show another modification of our said electron beam use invention, by our novel glow discharge electron beam to excite CW lasers, namely, in its use with a hollow cathode discharge, as shown in FIG. 4. This works in the following way. A transverse hollow cathode discharge is established between cathode 99 and anode 81, creating a plasma 62 that can be used as laser active medium. Simultaneously, the electron beam generated 43 is shot into the plasma region. The combination of both discharges provides a plasma with a high density of energetic electrons that is used as laser active medium. This modification is preferred when metal vapor is used with helium or neon to form the laser active medium, and in the case of metal vapors with a low pressure, such as with Cu, Ag, Ag, Al, etc. In this case the cathode of the transverse hollow cathode discharge is made of the material in which we want to obtain laser action, for example Cu. In FIG. 4, 70 represents the necessary negative high voltage connections, and with each connection being also a cathode support. In this laser modification when the hollow cathode discharge is established, as explained, a metal vapor concentration is produced in the plasma region 62 by sputtering of the cathode material. In this modification there is no electromagnet required; also two electron guns 31 can be used, one at each end of the hollow cathode tube, similarly as before in FIG. 2, though only one gun is shown.

DEPR:

(a) the novel combination of a transverse hollow cathode discharge and an external glow discharge electron beam from our solid electron gun 31, to create

a plasma in the hollow cathode to be used as laser active medium; and

DEPR:

Our electron gun, of FIGS. 1, 2, 3 and 4, indicated generally as 31, is longitudinally vertically sectional detailed illustrated in FIG. 5. Our gun 31 has a solid cathode end 1, with its outer surface indicated as 31a, constructed as shown, of explained material that has a high secondary electron emission coefficient per incident ion bombarding the cathode surface. Such a cathode material is aluminum with an aluminum oxide (Al.sub.2 O.sub.3) surface coating, or magnesium with a magnesium oxide (Mg.sub.2 O.sub.3) as the surface coating. That oxide surface coating and not the pure metal has a high yield of secondary electrons, on gun operation. Oxide coatings and insulators have higher secondary electron emission coefficients than do pure metals. We shield our cathode 31b by a ceramic, glass, quartz, or other non-conductive material, as by tube 2, as shown, to restrict electron emission therefrom only to the cathode front being outer 31a face. The cathode front end face 31a we make concave, as shown in FIG. 5 to produce a well collimated and focused electron beam thereby therefrom, which beam emanates or is shot from that outer face only. Electron gun 31 is suitably water cooled, namely, the cathode 1 is water cooled by means of circulating water, through a provided reservoir, by copper tube 4 into said donut-like hollow reservoir 3, constructed as shown, and located around tube 5, directly contacting and behind the cathode material 1. Cathode 1 is pressed into the copper ring tubular donut water reservoir 3, for water cooling of the cathode, by heat conduction into the water. Water is circulated by a pair of copper tubes 4 leading in and out of the water reservoir 3, one tube being the water source inlet water tube and the other being the water outlet for water circulation therethrough 4. Through our solid electron gun's central axis, we insert a quartz tube 5 to insulate the wall of the axial hole of the gun. Thus we inhibit electron emission from the interior of the hole and confine that electron emission to the front face 31a only. Tube 5 also provides an optical path to permit matching the volume of the electron beam created plasma from and within tube 10 with the volume of the optical resonators 40 and 41. A negative high voltage (-HV) is electrically connected to cathode 31 through the copper water tube and outlet jacket 3 and 4 by the -HV being connected to the tube 4 as diagrammatically shown. A conventional brewster window W is attached to the end of the quartz tube 5 opposite the cathode to seal the tube. A metal end plate F is inserted as shown at the outer gun 31 tube 2 end, as a vacuum seal opposite cathode 1 end. Thus we have a solid outer end surface face, indicated as 31a, of our cathode end 1 of our gun 31, from which solid face our electron beam is emitted on gun 31 operation.

DEPR:

The operation of Applicants' present invention modification will now be described. Referring to our first modification, FIGS. 1, 2, 3 and 4, and to FIG. 5 detail of our said novel gun, illustrating the longitudinal beam use of our solid electron gun discharge, upon application of a high negative D.C. potential (-HV), to the gun, as explained, connected to one of its water pipes 4, and with suitable ground connection to the gun housing 33, as shown, a well collimated electron beam emanates only from that outer concave face end surface 31a of our solid electron gun 31. Those beams enter the laser tube 10, in manner and for purposes as explained.

DEPR:

An alternative modification design, to the longitudinal excitation combination of FIGS. 1, 2, 3 and 4, is a transverse electron beam excitation scheme, as shown in FIGS. 6 and 7. In this case transverse glow discharge electron guns 51 are used, as shown diagrammatically at FIGS. 6 and 7. These two electron guns 51 generate an electron sheath of approximately 0.5 cm width and 20 to 50 cm in length. The operating voltage is lower than the one corresponding to the electron gun of FIGS. 1, 2, 3 and 4. However the fundamentals of the electron sheath generation by the transverse electron guns 51 are the same as the ones involved in the generation of the pencil form electron beam of 31 for longitudinal excitation previously described and illustrated in FIGS. 1, 2, 3 and 4. In the transverse pair of guns 51 scheme of FIGS. 6 and 7, two solid transverse electron guns 51 are placed in front of each other as shown in FIGS. 6 and 7, and each with an insulator cover and each cover having an aligned opposing longitudinal gap opening, as shown in FIG. 7. A suitable housing 53 encompasses those guns, and a helium and oxygen mixture is supplied in that housing. In this way the electrons emitted by the glow discharge electron guns 51 excite and ionize that gas mixture in the region B between the two guns. This thus excited plasma is the laser active medium. The electrons emitted by one of the guns are electrostatically "reflected" in the dark space, indicated as D, of the opposite electron gun. In this way the electron beam is partially trapped between the cathodes dark spaces D and its energy is efficiently deposited into the plasma between the guns 51 in 53. The opposing cathode configuration is an important feature of this transverse electron beam laser scheme. Suitable reflector dielectric mirrors 90-91 are provided and positioned as shown in FIG. 6. The excited laser beam thus formed leaves the housing 53 at a provided hole 80, in this FIGS. 6 and 7 modification, and bounces between aligned dielectric resonators 90-91, as shown in FIG. 6. Suitable electric ground and negative high voltage (-HV) wiring connections are provided, in this modification, as illustrated in FIGS. 6 and 7, with the anode connection being at 20a pump tube. A magnetic field could also be provided in this modification to enhance the electron beam trapping in the space between the guns. The cathodes 51 in this modification always appear in pairs, and they can be segmented and individually ballasted with resistors to improve discharge stability and provide high discharge power density deposition. For example, 10 pairs of 5 cm long cathodes could be used to create a 50 cm long plasma. Each gun 51 is made of suitable solid material with a high secondary electron emission coefficient, and has a ceramic shield 31b for reason as before. To increase said gas density in the active medium region, in the housing in the region inbetween the electron guns 51, a conventional atomic or molecular injection jet 50 is used, as diagrammatically shown in FIGS. 6 and 7, adjacent to and over the plasma B area. In this way a large or high gas density (approximately 3.times.10.sup.17 cm.sup.-3) can be obtained in the active medium region between those two guns, when the region close to the electron guns is at a lower pressure, so as to obtain optimum gas pressure for the electron beam efficient operation generation by the guns. To achieve this molecular or atomic gas density, the jet nozzle 50 is used and the gas is introduced thereby, to form a mixture of gas and metal vapor, in B from nozzle 11a, when a metal vapor is used for mixture with the gas. Opposite to this nozzle, in FIG. 7, a metal vapor trap 20a in housing 53 is connected to a suitable vacuum pump, in this modification. As before, a continuous vacuum in

53 is maintained by the vacuum pump at 20a, for causing less than atmospheric pressure always in housing 53.

DEPR:

Applicants have another electron beam method of CW laser excitation, within the teaching of our invention, illustrated in FIGS. 8, 9 and 10, being a low voltage excitation of noble gas ion lasers. We use a low voltage (80 to 500 V) electron beam, with the beam produced by a low voltage glow discharge gun or a gun with a thermoionic cathode. By this scheme, we can increase the efficiency and power of noble gas ion lasers in the visible and ultraviolet parts of the spectrum. We have a low voltage transverse electron beam laser, using the thermoionic emitting cathode of a planar cathode, shown in end view, diagrammatically in FIG. 8. We use two ways to produce this low voltage transverse electron beam for the excitation of CW ion lasers. The first one, diagrammatically shown as FIG. 8, consists in using a hot cathode (dispenser or oxide coated cathode) and an anode accelerating grid. The hot cathode can be either directly or indirectly heated to the necessary temperature to achieve high electron emission (900.degree. to 1150.degree. C. for the case of dispenser cathodes). The cathode emits only from the surface facing the accelerating grid. Emission from all other of the cathode surfaces is inhibited. This electron gun is placed in a container, previously evacuated, and filled with a noble gas at a pressure between 0.05 and 4 torr. The accelerating grid is placed very close to the emitting cathode surface (approximately 0.5 mm) and biased to a voltage between 80 and 500 volts positive respect to the cathode. Electrons emitted from the hot cathode suffer a negligible amount of collisions before arriving to the anode, and on the way they are able to gain on energy equal to eV_c where e is the electron charge and V_c the voltage difference between the cathode and the anode. In this way we cause an electron beam to ionize and excite a noble gas (argon as an example) and cause a plasma in which a population inversion is achieved. Thus, this plasma is used as active medium for CW ion lasers. The discharge, indicated as F, is transverse, that is, the electrons are emitted and accelerated perpendicular to the axis of the plasma. The axis of the plasma is also the optical axis, and two dielectric mirrors (not shown) are used to conform an optical resonator, as before. One of these mirrors is a total reflector at the wavelength at which laser action wants to be achieved (example in argon at 4765 .ANG., 4880 .ANG., 4965 .ANG., 5145 .ANG., etc.). The other mirror is a partial reflector at these wavelengths.

DEPR:

A low voltage electron beam pump laser can also be produced by using a low voltage glow discharge electron gun, as diagrammatically illustrated, as end view FIG. 10. A horseshoe hollow cathode constitutes the cathode of the glow discharge. In this case the electrons of the glow discharge are extracted from that glow by a voltage (VB) applied to an extraction grid and are accelerated by a potential (VC) applied to an accelerating grid. These grids are at a distance of approximately 0.5 mm from each other. The electron passing through the accelerating grid (biased to 80 to 500 volts positive respect to the cathode) constitutes the transverse electron beam that is used to excite the plasma in the housing and that constitutes the laser active medium. This is diagrammatically illustrated in FIG. 10, which is of an end view of a low voltage electron beam pump laser using a glow discharge electron gun. This

modification, of FIG. 10, has: a cathode as 111; an anode grid as 112; an extraction grid as 113; an acceleration grid as 114; a grid support as 115; a cathode support as 116; a vacuum envelope housing 117; and an electron beam and electron beam created plasma indicated as 118. The extraction grid separates the hollow cathode discharge from the acceleration region. Its potential (VB) controls the current extracted from the hollow cathode discharge. The hollow cathode discharge is produced between cathode 111 and anode 115, and is the source of electrons in this modification.

DEPR:

A design for our glow discharge low voltage electron gun is illustrated in FIG. 8, however, we want to make clear that also other electrode configurations can be used, as the one in this FIG. 8 is an example. A diagram of two possible designs for the low voltage hot cathode electron beam electron guns are diagrammatically shown in FIGS. 8 and 9. FIG. 9 is a diagrammatic end view of another of our modified low voltage transverse electron beam plasma method, using the thermoionic emitting surface of a cylindrical cathode electron gun. This is also a low voltage hot cathode electron gun producing electron beams, as shown. Instead of a flat cathode we here use a round cylindrical one. This one has: as anode perforated electrode as 121; a cathode 122 (the internal surface is the emitting surface); a vacuum housing envelope as 123; and the produced electron beam and electron beam created plasma, which is the laser active medium, illustrated as 124.

CLPR:

6. A laser as in claim 1, wherein said glow discharge electron gun includes an axial opening, said glow discharge electron gun being positioned such that said axial opening is coaxial with the optical axis of the enclosure for allowing an unobstructed optical path between the two mirrors.

CLPR:

7. A laser as in claim 6, further comprising a shielding material lining said axial opening of said glow discharge electron gun.

CLPR:

8. A laser as in claim 1, wherein the glow discharge electron gun is positioned outside the optical axis of the enclosure, said laser further comprising magnetic means for deflecting the electron beam to be colinear with said optical axis.

CLPR:

9. A laser as in claim 6, wherein said glow discharge electron gun is positioned adjacent one end of said enclosure, said laser further comprising a second glow discharge electron gun positioned adjacent the opposite end of said enclosure, said second glow discharge electron gun also having an axial opening and being positioned in axial alignment with said first mentioned glow discharge electron gun.

CLPR:

10. A laser as in claim 1, further comprising metal vapor trap means positioned adjacent said glow discharge electron gun for collecting metal vapor.

CLPV:

a **glow** discharge electron gun contained within said single enclosure and having a solid wall cathode, said solid wall cathode having one or more faces emitting beam electrons, said one or more faces emitting beam electrons being constructed of a high secondary electron emission coefficient material for producing a large number of secondary electrons per incident bombarding ion, said **glow** discharge electron gun being coupled to receive a source of operating voltage sufficient to cause emission of beam electrons therefrom and being physically positioned to inject those beam electrons into the gas laser medium within the single enclosure, thereby exciting the gas laser medium to become a plasma volume for employment as a laser active medium; and

CLPV:

producing a direct current beam of high energy electrons using a **glow** discharge electron gun located within said evacuated chamber; and

CLPV:

exciting the gas-vapor mixture with said direct current beam of high energy electron to create a negative **glow** discharge plasma volume having an electron distribution that has a larger number of high energy electrons than a Maxwellian distribution of the same electron density for employment as a laser active medium.

CLPV:

producing a direct current beam of high energy electrons using a **glow** discharge electron gun located within said evacuated chamber; and

CLPV:

exciting the single gas with said direct current beam of high energy electrons to create a negative **glow** discharge plasma volume having an electron distribution that has a larger number of high energy electrons than a Maxwellian distribution of the same electron density for employment as a laser active medium.

ORPL:

Crocker, "Pulsed Atmospheric--Pressure Carbon--Dioxide Laser Initiated by a Cold--Cathode **Glow**--Discharge Electron Gun", Electronics Letters, vol. 8, No. 18, Sep. 7, 1972, pp. 460-461.

US-PAT-NO: RE32305

DOCUMENT-IDENTIFIER: US RE32305 E

TITLE: Method of employing a television receiver for active participation

DATE-ISSUED: December 16, 1986

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Baer; Ralph H.	Manchester	NH	N/A	N/A

US-CL-CURRENT: 463/3,273/430 ,345/180 ,434/20 ,463/5

ABSTRACT:

The present invention pertains to .[an apparatus and.]. .ladd.a .laddend.method, in conjunction with standard monochrome and color television receivers, for the generation, display, manipulation, and use of symbols or geometric figures upon the screen of the television receivers for the purpose of .[training simulation, for.]. playing games.[., and for engaging in other activities.]. by one or more participants. The invention comprises in one embodiment a control unit, connecting elements and in some applications a television screen overlay mask utilized in conjunction with a standard television receiver. The control 10 unit*includes the control, switches and electronic circuitry for the generation, manipulation and control of video signals which are to be displayed on the television screen. The connecting elements couple the video signals to the receiver antenna terminals thereby using existing electronic circuits within the receiver to process and display the signals. An overlay mask which may be removably attached to the television screen may determine the nature of the game to be played or the training simulated. Control units are provided for each of the participants. In the present invention dots are generated on a television screen and controls are provided to cause one dot to overlap the other. Alternatively, a photoelectric element senses light emitted by a displayed dot and denotes that the light has been sensed.

7 Claims, 26 Drawing figures

Exemplary Claim Number: 2,11

Number of Drawing Sheets: 11

DATE FILED: June 27, 1977

REISSUE-OF:

US-PAT-NO: 03829095

DATE-ISSUED: August 13, 1974

APPL-NO: 062691

DATE-FILED: August 10, 1970

----- KWIC -----

DEPR:

One game which may be played employing the concepts of this invention is target shooting. A "toy" gun containing a photocell is electrically coupled to the control unit.

DEPR:

Referring now to FIG. 10, initially pressing a reset switch 142 sets the equipment. Reset switch 142 is a double pole single throw switch. The modulation from the coded symbol incident at a photocell 136 is supplied via a buffer amplifier 137, and an amplifier and pulse shaper 138 to a flip-flop 139 which is triggered. The output from flip 139 is applied via a buffer amplifier 141 to a lamp 140 which will light with a steady glow until reset indicating the correct answer was chosen.

US-PAT-NO: RE32282

DOCUMENT-IDENTIFIER: US RE32282 E

TITLE: Television gaming apparatus

DATE-ISSUED: November 11, 1986

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Baer; Ralph H.	Manchester	NH	N/A	N/A

US-CL-CURRENT: 463/3,273/430 ,345/180 ,434/20 ,463/31 ,463/5

ABSTRACT:

The present invention pertains to an apparatus .[.and method.], in conjunction with standard monochrome and color television receivers, for the generation, display, manipulation, and use of symbols or geometric figures upon the screen of the television receivers for the purpose of .[.training simulation, for.]. playing games.[., and for engaging in other activities.]. by one or more participants. The invention comprises in one embodiment a control unit, .ladd.an apparatus .laddend.connecting .[.means.]. .ladd.the control unit to the television receiver .laddend.and in some applications a television screen overlay mask utilized in conjunction with a standard television receiver. The control unit includes the control .[.means.]. .ladd.circuitry.laddend., switches and .ladd.other .laddend.electronic circuitry for the generation, manipulation and control of video signals which are to be displayed on the television screen. The connecting .[.means.]. .ladd.apparatus selectively .laddend.couples the video signals to the receiver antenna terminals thereby using existing electronic circuits within the receiver to process and display the signals .ladd.generated by the control unit in a first state of the coupling apparatus and to receive broadcast television signals in a second state of the coupling apparatus.laddend.. An overlay mask which may be removably attached to the television screen may determine the nature of the game to be played or the training simulated. Control units .[.are.]. .ladd.may be .laddend.provided for each of the participants. Alternatively, games.[., training simulations and other activities.]. may be carried out in conjunction with background and other pictorial information originated in the television receiver by commercial TV, closed-circuit TV or a CATV station.

18 Claims, 26 Drawing figures

Exemplary Claim Number: 27

Number of Drawing Sheets: 11

DATE FILED: June 27, 1977

REISSUE-OF:

US-PAT-NO: 03728480

DATE-ISSUED: April 17, 1973

APPL-NO: 126966

DATE-FILED: March 22, 1971

----- KWIC -----

DEPR:

One game which may be played employing the concepts of this invention is target shooting. A "toy" gun containing a photocell is electrically coupled to the control unit.

DEPR:

Referring now to FIG. 10, initially pressing a reset switch 142 sets the equipment. Reset switch 142 is a double pole single throw switch. The modulation from the coded symbol incident at a photocell 136 is supplied via a buffer amplifier 137, and an amplifier and pulse shaper 138 to a flip-flop 139 which is triggered. The output from flip 139 is applied via a buffer amplifier 141 to a lamp 140 which will light with a steady glow until reset indicating the correct answer was chosen.

CLPR:

denoting means. 20. The combination of claim 19 wherein said light sensing means is a photosensitive element arranged within the barrel of a toy gun.
.[21. The combination of claim 14 in which said television receiver is a color receiver, said combination further including a chroma generator having inputs from said horizontal sync generator and said coincidence denoting means and an output to said signal summing means, such that coincidence will also be indicated by a changing of background color of

US-PAT-NO: 4586715

DOCUMENT-IDENTIFIER: US 4586715 A

TITLE: Toy laser pistol

DATE-ISSUED: May 6, 1986

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Scolari; John E.	La Mesa	CA	N/A	N/A
Warner; Robert T.	Poway	CA	N/A	N/A
Deavenport; Joe E.	San Diego	CA	N/A	N/A

US-CL-CURRENT: 463/50,273/DIG.24 ,362/112 ,362/113 ,362/84 ,434/21 ,463/5

ABSTRACT:

A toy laser weapon such as a pistol utilizes a flash unit to generate a burst of high intensity light. A collimating device collimates the light into a beam simulating a laser beam. A target vest can be worn by the person that is the target of the simulated laser pistol and includes a target area of fluorescent material that indicates a hit when the light beam from the toy laser pistol strikes the target area. Also, a sound generator can be provided to emit a sound when the burst of light occurs. An exemplary circuit for use with the light pistol is also part of the invention.

38 Claims, 10 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 5

DATE FILED: June 7, 1984

----- KWIC -----

DEPR:

The burst of high intensity light from flash lamp 24 passes through collimating lens 46. The handle portion 16 is preferably formed of translucent plastic and the burst of light travels through the collimating lens 46 along barrel 14. The barrel may be transparent or semi-transparent and can be lined with reflective particles 48 if desired to cause the light to bounce about the barrel and give an unusual light bouncing effect around the barrel. The collimated beam of light passes out the end of barrel 14 and simulates a laser beam. The tip 50 is transparent and coated inside with fluorescent material so that the tip glows even after the burst of high intensity light has passed.

DEPR:

A target in the configuration of a vest is shown at 52 in FIG. 7, and is an optional aspect of the invention. The vest 52 includes a target area 54 of light reflecting or fluorescent material which will glow for a period of time after the light beam 55 strikes it. A similar target area 57 is positioned in the center of the back of the vest 52. The vest is fastened in place with fastener strips 56 and 58, which may be the conventional hook and pile type fastener. A fluorescent name tag is shown at 60 and fluorescent insignia at 62 and 64. The vest 52 adds to the space age atmosphere created in using the toy

and records hits by the simulated laser beam 55. The vest 52 also serves as a highly effective protection device for a child when worn at night. When the child is in the street, the light beam of a vehicle strikes the target area 54, tag 60, insignia 62 and 64 and the reflective portion 57 on the back of the vest 52, glowing brightly to indicate the presence of the child.

DEPR:

Each time the trigger switch 127 is closed after on/off switch 126 has been closed, flash lamp 61 emits a short, bright flash and speaker 134 emits a burst of sound simultaneously with the flash. After the storage capacitor is charged a DC voltage of about 350 volts exists on line 147 and line 151 has a steady 450 volts applied to it. At the instant of closing trigger switch 127, the voltage from power supply 115 is applied to gate 152 of SCR 153, causing it to conduct and the lamp to flash. At that instant, time $t_{sub.o}$, the voltage on both of lines 147 and 151 drops to zero, and then builds back quickly asymptotically to the normal values as shown by the associated waveforms. As soon as the flash tube fires, the feedback network and comparator function to commence operation of the oscillator, thereby recharging storage capacitor 59. This is normally accomplished within about one second, whereby the toy gun is then available for "firing" again with another brilliant flash.

CLPR:

3. The toy laser weapon recited in claim 1 and further comprising a fluorescent tip located on the end of said barrel means for glowing after the burst of high intensity light has been fired.

US-PAT-NO: 4509451

DOCUMENT-IDENTIFIER: US 4509451 A

TITLE: Electron beam induced chemical vapor deposition

DATE-ISSUED: April 9, 1985

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Collins; George J.	Ft. Collins	CO	N/A	N/A
Thompson; Lance R.	Ft. Collins	CO	N/A	N/A
Rocca; Jorge J.	Ft. Collins	CO	N/A	N/A
Boyer; Paul K.	Ft. Collins	CO	N/A	N/A

US-CL-CURRENT: 118/50.1,118/620 ,118/723FE ,118/723HC ,204/164 ,427/570 ,427/596

ABSTRACT:

Applicants have invented a new low temperature method (50.degree. C. to 500.degree. C.) to deposit and grow microelectronic thin films using cold cathode electron beams to initiate and sustain both gas phase and surface chemical reactions. The new method uses electron beams generated by glow discharge electron guns. Secondary electrons are emitted from these electron guns following ion and fast neutral bombardment upon cathode surfaces and secondary electrons so formed are accelerated in the cathode sheath.

Our method uses the plasma generated electron beams to decompose reactant molecules directly by electron impact and indirectly by the vacuum ultraviolet radiation generated following rare gas electron collisions in the beam region. The reactant molecules can be in the gas phase or adsorbed on substrate surfaces. The electron beams are spatially confined and excite only a localized region above the substrate so that direct plasma bombardment of the substrate is avoided. The film growth and deposition reactions take place on a heated (50.degree. C.-500.degree. C.) substrate therefore with reduced radiation damage at high deposition and growth rates required for in line single wafer processing (>1000.ANG./min). Microelectronic films such as insulators, conductors and semiconductors can be deposited and native films such as oxides and nitrides can be grown with the use of electron beam assisted decomposition of gas molecule reactants.

25 Claims, 4 Drawing figures

Exemplary Claim Number: 17

Number of Drawing Sheets: 2

DATE FILED: March 29, 1983

----- KWIC -----

ABPL:

Applicants have invented a new low temperature method (50.degree. C. to 500.degree. C.) to deposit and grow microelectronic thin films using cold cathode electron beams to initiate and sustain both gas phase and surface chemical reactions. The new method uses electron beams generated by glow

discharge electron guns. Secondary electrons are emitted from these electron guns following ion and fast neutral bombardment upon cathode surfaces and secondary electrons so formed are accelerated in the cathode sheath.

BSPR:

Electron beams used to dissociate and activate the reactant gases are produced by a glow discharge, cold cathode electron gun, operating at pressures between 0.01 and 5 Torr in a mixture of a rare gas (e.g. He, Ar) and other reactant gases without the need of differential pumping. A high negative potential (0.5-10 kV) applied to the cathode, drops mainly across the dark space or cathode sheath region. Ions and fast neutrals from the bulk of the plasma accelerate through the dark space towards the cathode and bombard the cathode surface. Thus, electrons are emitted from the cathode, which is made of a high electron emission coefficient material. The electrons are accelerated through the dark space away from the cathode by the high electric field existing in that region.

BSPR:

High energy electrons emitted from the glow discharge electron gun collide directly with the reactant gas molecules thereby dissociating these reactant species and creating free radicals including excited atoms and positive and negative ions. Alternatively the vacuum ultraviolet rare gas photons and rare gas sensitized reactions can cause reactant dissociation via photo-absorption and sensitized gas collisions respectively. Secondary electrons are emitted in the ionizing collisions of beam electrons with atoms and molecules. Many of these secondary electrons also have enough energy to excite, ionize and dissociate the reactant molecules. The excited and radical species diffuse across a boundary layer to a heated substrate. Nucleation occurs at adsorption sites leading to the formation of islands. The reactions continue with coalescence of the islands and finally a uniform film is created. VUV photons and sensitized collisions occurring at the surface will aid these reactions.

DEPR:

A d.c. power supply [14] of up to 10 kV provides the potential to establish the glow discharge electron beam [5]. The electron gun could also be operated on a pulse basis, using a different power supply and a pulsed gas flow.

DEPR:

The third embodiment of the invention, as shown in FIG. 3, includes an electron gun [1C] comprised of a ring shaped cathode [2C] with a resulting disc shaped electron beam generated plasma. As in the other embodiments, the electron gun includes a water inlet/outlet, water pool cooling system [4C] and a shield [3C] to confine electron emission to a limited region of the cathode surface [6C]. The shield is such that a planar sheet of electrons [5], as shown in FIG. 2, accelerates through the cathode dark space [7], also as shown in FIG. 2, and travels parallel to a heated substrate [9C]. In all other ways this embodiment is the same as the first and second embodiments except for the geometry.

CLPR:

4. A chemical vapor deposition and native film growth apparatus as in claim 1 wherein the glow discharge, cold cathode electron gun includes a cathode comprising a material having a high secondary electron emission coefficient by

ion bombardment and a low sputtering yield.

CLPR:

22. A chemical vapor deposition and native film growth apparatus as in claim 1 further comprising one or more additional glow discharge, cold cathode electrons guns positioned within the reaction chamber for producing a planar sheet of high energy electrons parallel to a surface of the substrate upon which it is desired to deposit or grow a film.

CLPR:

23. A chemical vapor deposition and native film growth apparatus as in claim 1 wherein the glow discharge, cold cathode electron gun includes a cathode shaped in the form of a ring and adapted to produce a disc-like sheet of high energy electrons parallel to a surface of the substrate upon which it is desired to deposit or grow a film.

CLPR:

24. A chemical vapor deposition and native film growth apparatus as in claim 4 wherein one of the one or more selected gases is a film donor gas that is introduced into the reaction chamber in close proximity to the substrate and wherein another one of the one or more selected gases is a buffer gas that is introduced into the reaction chamber in close proximity to an electron emitting surface of the cathode of said glow discharge, cold cathode electron gun and whereby the electron beam is operative for exciting molecules of the buffer gas to produce ultraviolet and vacuum ultraviolet photons to dissociate molecules of the film donor gas in a region that is in close proximity to the substrate.

CLPV:

a glow discharge, cold cathode electron gun for producing a beam of high energy electrons, said glow discharge, cold cathode electron gun being positioned within the reaction chamber for exciting, ionizing, and dissociating molecules of the one or more gases introduced into the reaction chamber in a region therein defined by the beam of high energy electrons;

CLPV:

power supply means for providing a source of negative high voltage to the glow discharge, cold cathode electron gun to start and maintain the production of the beam of high energy electrons therefrom.

US-PAT-NO: RE31388

DOCUMENT-IDENTIFIER: US RE31388 E

TITLE: Air-bakeable water-proof getter device and method of manufacturing

DATE-ISSUED: September 20, 1983

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hellier; Stephen J.	Milan	N/A	N/A	ITX
Passoni; Anselmo G.	Milan	N/A	N/A	ITX

US-CL-CURRENT: 417/48,252/181.4 ,313/561 ,427/248.1 ,427/387

ABSTRACT:

A getter device with an organosilane coating.

19 Claims, 6 Drawing figures

Exemplary Claim Number: 1,9,12

Number of Drawing Sheets: 1

DATE FILED: September 24, 1980

REISSUE-OF:

US-PAT-NO: 04127361

DATE-ISSUED: November 28, 1978

APPL-NO: 745982

DATE-FILED: November 29, 1976

----- KWIC -----

DEPR:

FIG. 3 shows a partial cross-section of a color display tube 30 comprising a shadow mask 31, an electron gun assembly 32 and an iron screening element 33. A first exothermic getter device 10' treated according to the above organosilane process is assembled onto the electron gun. The getter device and electron gun are previously washed in tepid water, which may also contain a small amount of surface active agent. A second getter device 10", again treated according to the above process, is attached to the iron screen 33. The second getter device 10" does not have to be washed but it may remain exposed to the atmosphere and hence humidity for relatively long times before final tube assembly. Furthermore, the second getter device 10" is already attached to iron screen 33 during sealing of the face plate 34 to the cone 35 by means of the hermetic seal 36. This sealing process takes place at 400.degree. C. or more and lasts for 1 hour.

DEPR:

The "Frit test" referred to in the table is an air heat treatment for 1 hour at 420.degree. C. and subsequent "flash" in vacuum. "Explosion" is observed by visual observation of vigorous ejection of glowing particles from the getter device.

US-PAT-NO: 4395465

DOCUMENT-IDENTIFIER: US 4395465 A

TITLE: Magnetic recording medium and process for production thereof

DATE-ISSUED: July 26, 1983

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Takagi; Toshinori	Nagaokakyo	N/A	N/A	JPX
Nakata; Shinsaku	Toyo_aka	N/A	N/A	JPX
Mikami; Yoichi	Kyoto	N/A	N/A	JPX
Hotta; Masahiro	Osaka	N/A	N/A	JPX
Fukumoto; Yoshiyuki	Osaka	N/A	N/A	JPX

US-CL-CURRENT: 428/626,204/192.2 ,427/525 ,427/531 ,428/694TM ,428/928 ,428/934

ABSTRACT:

A magnetic recording medium comprising

(a) a flexible substrate of a polymeric material,

(b) a first magnetic layer of a ferromagnetic metal deposited on the substrate by an ionized cluster beam deposition method, and

(c) a second magnetic layer of a ferromagnetic metal deposited on the first magnetic layer by a high-vacuum ion plating deposition method, and a process for producing a magnetic recording medium which comprises

imparting a kinetic energy in the range of 100 eV to 10 KeV to an ionized cluster composed of ferromagnetic metal atoms in a high vacuum corresponding to a pressure of 8×10^{-4} to 1×10^{-10} torr and impinging the resulting ionized cluster beam against a flexible substrate of a polymeric material to deposit a first magnetic layer of the ferromagnetic metal on the substrate, and

imparting a kinetic energy in the range of 1 eV to 10 KeV to atom ions of a ferromagnetic metal by an ion plating method in a high vacuum corresponding to a pressure of 8×10^{-4} to 1×10^{-10} torr, and impinging the resulting atom ion beam against the first magnetic layer to deposit a second magnetic layer of the ferromagnetic metal on the first magnetic layer.

4 Claims, 4 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 2

DATE FILED: August 7, 1981

----- KWIC -----

BSPR:

Specifically, because thin-film type magnetic recording media formed by wet plating or vacuum deposition have a very low adhesion strength between the

magnetic layer and the substrate, they have the defect that the magnetic layer tends to be peeled, worn or otherwise damaged by mechanical friction which occurs upon contact with the magnetic head during recording and playback. Thin film-type magnetic recording media formed by sputtering and ion plating have an improved adhesion strength between the magnetic recording layer and the substrate. Since, however, film formation by these methods relies on the utilization of glow discharge or plasma in a low vacuum corresponding to 10^{-3} torr or higher, the inclusion of residual gases and impurities adversely affects the crystallinity of the ferromagnetic layer, and the resulting magnetic recording medium has defective magnetic characteristics typified by reduced squareness ratios. Owing to the non-uniformity of a discharging condition, the magnetic recording media obtained by these methods vary in film quantity and magnetic characteristics.

DEPR:

Referring to FIG. 4, there is shown an electron beam evaporation source 40 consisting of an E gun 43, a water-cooled copper hearth and a vapor source material (a power supply is not shown). Shown at 46 is a baffle plate for hampering passage of a vapor. A vapor flow 47 which advances as shown is ionized in an ionizing section 48. The ionizing section 48 is comprised of a filament 49 for emitting thermoelectrons, a mesh electrode 50 for accelerating electrons in an electric field and a guard 53 for field control.

US-PAT-NO: 4313273

DOCUMENT-IDENTIFIER: US 4313273 A

TITLE: Firearms and laser beam aim assisting methods and apparatus

DATE-ISSUED: February 2, 1982

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Matthews; John W.	Fountain Valley	CA	N/A	N/A
Fraer; Michael J.	Sierra Madre	CA	N/A	N/A

US-CL-CURRENT: 42/117,42/71.02 ,42/84

ABSTRACT:

A firearm has a firing device, a manually cockable and selectively releasable hammer for actuating the firing device and a selectively activable laser beam emitting device for providing an aiming mark on a target of the firearm. The laser beam emitting device is activated through cocking of the hammer to provide the aiming mark. The cocked hammer is released with a finger trigger for actuation of the firing device only after activation of the laser beam emitting device and provision of the aiming mark.

41 Claims, 11 Drawing figures

Exemplary Claim Number: 11

Number of Drawing Sheets: 3

DATE FILED: April 25, 1979

----- KWIC -----

BSPR:

Even though the last twenty years have seen substantial increases in battery power capacity, proposals to accommodate a battery in the handgrip have been limited to the target game field, such as in the above mentioned U.S. Pat. No. 3,294,401, where such a battery energizes a flash tube in a toy gun for illuminating photocell targets, and to the marksman training field, where a battery in the stock of a weapon energizes a small solid state laser device for training purposes, as apparent from the above mentioned U.S. Pat. No. 3,995,376. Particularly the low power consumption of laser diodes and similar solid-state devices permits accommodation of the requisite low-energy batteries in the laser transmitter assembly, aiming light adapter or simulated firearm structure itself. However, such designs using only laser diodes are generally relegated in their utility to the marksmanship training and weapon fire simulation fields, as appears from the above mentioned U.S. Pat. Nos. 3,633,285, 3,867,764 and 3,898,747.

DEPR:

The laser beam aiming assistance equipment 10 according to the illustrated preferred embodiment of the subject invention shown in FIG. 1 may be mounted on or used in conjunction with a basically conventional firearm 12, such as a Colt double action revolver 12, having a frame 13 and a barrel 14 threaded therein and projecting therefrom in the form of a barrel assembly 15. The aiming

assistance equipment 10 preferably employs a gas laser for emitting, when activated, a laser beam 16 providing an aiming mark in the form of a light spot on a target of the firearm. By way of example, a suitable laser is the helium-neon laser employing electrical glow discharge excitation.

DEPR:

At the same time, the currently discussed aspect of the subject invention avoids the space and battery capacity limitations implicit in proposals which suggested insertion of the battery in the stock proper or frame of the weapon itself (see U.S. Pat. Nos. 3,294,401 and 3,995,376, suggesting such an inclusion of batteries for a toy gun and a laser training device).

US-PAT-NO: 4239129

DOCUMENT-IDENTIFIER: US 4239129 A

TITLE: Water pistol and/or flashlight structure

DATE-ISSUED: December 16, 1980

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Esposito; Gary F.	Portage	IN	46368	N/A

US-CL-CURRENT: 222/79,362/112

ABSTRACT:

The subject invention involves a toy water pistol which embodies improvements with respect to a reciprocal pump therefor for building up pressure against a liquid for ejecting a stream thereof forwardly through a nozzle an appreciable distance; valve means for controlling the flow of the liquid; a source of electricity; light responsive means and lamps therefor for constituting means for illuminating the stream; a buzzer and a switch for controlling the operation of the lamp and buzzer; and a trigger for simultaneously operating the valve means and switch.

35 Claims, 12 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: November 29, 1978

----- KWIC -----

CLPR:

14. The toy defined in claim 12, including a lamp and light responsive means located adjacent to said nozzle, a switch carried by said handle, conductors for connecting said lamp and switch with a source of electricity, and said trigger also serves to control the operation of said switch so that when said lamp is energized said responsive means will be illuminated to impart a glow to the water ejected through said nozzle.

CLPR:

28. An assembly for use in a toy water gun, said assembly comprising an elongated casing having an inlet for a liquid and an outlet therefor, an abutment disposed in said casing between said inlet and outlet and provided with an opening, a shaft reciprocally mounted in said casing and extending through said opening, a valve carried by said shaft and disposed between said abutment and said inlet, means for biasing said valve against said abutment for normally closing said opening, and said shaft being operable to disengage said valve from said abutment whereby liquid entering said inlet may be caused to flow through said outlet via said opening.

CLPR:

31. A toy water pistol comprising wall structure forming a barrel and a chamber therein extending throughout the major portion of its length for

containing water and a hollow handle, said barrel having a rear extremity provided with a center opening and a front extremity, a cylinder extending axially in said chamber and provided with a check valve for preventing back flow of air from said chamber into said cylinder, a piston disposed in said cylinder and having a rod extending therefrom and through said opening for manipulation for pumping air into said chamber, a nozzle located adjacent to said front extremity, conduit means for communicatively connecting said chamber and said nozzle, valve means disposed in said handle for controlling the flow of water through said conduit means to said nozzle, a lamp and light responsive means located adjacent to said nozzle, a switch carried by said handle, conductors connecting said lamp and switch with a source of electricity, and a trigger carried by said handle for controlling the operation of said valve means and said switch so that when said lamp is energized said responsive means will be illuminated to import a glow to the water ejected through said nozzle.

US-PAT-NO: 4220117

DOCUMENT-IDENTIFIER: US 4220117 A

TITLE: Apparatus for fabrication of magnetic recording media

DATE-ISSUED: September 2, 1980

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Shinohara; Koichi	Kobe	N/A	N/A	JPX

US-CL-CURRENT: 118/718,118/50 ,427/132 ,428/694TS

ABSTRACT:

Within the vacuum atmosphere containing oxygen a cylindrical rotary can and an evaporation source are disposed in opposed relationship and in such a way that the normal line constructed at the center of the evaporation surface of the evaporation source will not intersect the axis of the cylindrical rotary drum. The beam of the evaporating ferromagnetic substance is directed to and impinged against the substrate transported along the rotary drum at right angles to the direction of transport thereof.

2 Claims, 11 Drawing figures

Exemplary Claim Number: 1,2

Number of Drawing Sheets: 5

DATE FILED: January 31, 1979

----- KWIC -----

DEPR:

Disposed within the upper space 37 are the substrate supply and take-up rolls 41 and 42 and an electric discharge treatment device 43. The supply and take-up rolls 41 and 42 are reversed as rotary cans 44, 45 and 46 are reversed in either the direction A or B. If device is required for transporting in a zig-zag manner, a thin and wide substrate may be provided. But this not limit the scope of the present invention. The discharge treatment device 43 is connected through an insulated terminal 47 to a power source 48 which may be AC or DC. It is preferable to use an AC or RF glow. Furthermore, instead of introducing only argon gas into the upper space 37 as in the prior art, it is preferable to introduce a gas containing oxygen because the bonding strength between the thin film and the substrate may be considerably improved.

DEPR:

Disposed within the lower space 39 are a cylindrical rotary can 46 and an evaporation source 56 in opposed relationship with the rotary can 46. The evaporation source consists of an electron beam gun 57 and a water-cooled hearth made of copper for heating and evaporating the evaporation source 56.

DEPR:

According to the sixth embodiment, part of the beam of evaporating ferromagnetic substance is ionized. In FIG. 10 the ionization is effected by the high-frequency glow discharge, but any suitable discharges such as a

hot-cathode discharge which may be maintained in vacuum of the order of 10^{-4} torr may be used. The fundamental effects obtained are the same.

DEPR:

A glow discharge was effected at 13.56 MHz and 300 W, and the screen type electrode was grounded. The magnetic characteristics similar to those shown in FIG. 1 may be attained without the use of glow discharge which positively ionizes the beam of evaporating the ferromagnetic substance. That is, the vapor of evaporating ferromagnetic substance which is partially ionized as the substance is evaporated is made to pass through the screen type electrode which is maintained at 100 to 3000 DC V. This arrangement is also within the scope of the present invention. Thus, the present invention is very useful irrespective of whether the glow discharge is utilized or not.

US-PAT-NO: 4180403

DOCUMENT-IDENTIFIER: US 4180403 A

TITLE: Photohardenable films having high resolution containing nitroso dimers

DATE-ISSUED: December 25, 1979

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nacci, George R.	Wilmington	DE	N/A	N/A
Pazos, Jose F.	Claymont	DE	N/A	N/A

US-CL-CURRENT: 430/281.1,430/917 ,522/121 ,522/14 ,522/16 ,522/18 ,522/26 ,522/63 ,522/65

ABSTRACT:

Photohardenable films containing a photoactivated free-radical initiator and an inhibitor system composed of a noninhibiting nitroso dimer which dissociates to inhibiting nitroso monomer characterized by a dissociation constant of about $10^{\text{sup.}-2}$ - $10^{\text{sup.}-10}$ in solution at 25.degree. C. and a dissociation half-life of at least about 0.5 minute in solution at 25.degree. C., and having an optical density to initiating radiation of about 0.02-1.25 have high resolution after exposure at the proper energy density and time.

11 Claims, 0 Drawing figures

Exemplary Claim Number: 1

DATE FILED: December 7, 1977

----- KWIC -----

BSPR:

Photohardening is accomplished by exposure to radiation preferably having a wavelength range between about 3400A and 5000A, and between about 3800A and 5000A when aromatic-type nitroso dimers are employed. Shorter wavelengths which photodissociate the nitroso dimer should be present in only minor amounts. Suitable sources of such radiation, in addition to sunlight, include carbon arcs, mercury-vapor arcs, fluorescent lamps with ultraviolet-radiation-emitting phosphors, argon glow lamps, electronic flash units and photographic flood lamps. Electron accelerators and electron beam sources through an appropriate mask may also be used.

DEPR:

Each solution was used to coat copper-clad circuit boards to give 1.3 mil (0.0033 cm) coatings as described in Example 7, and the layers were subsequently top-coated with polyvinyl alcohol solution. The boards were exposed as described; washout was carried out using a solution of 50 g of 2-butoxyethanol and 5 g of sodium tetraborate decahydrate in 455 g of water in a spray gun held 2 in (5.08 cm) from the samples. The highest resolution elements were determined for each plate, and the results are tabulated in Table X.

US-PAT-NO: 4127361

DOCUMENT-IDENTIFIER: US 4127361 A

TITLE: Air-bakeable water-proof getter device and method of manufacturing same

DATE-ISSUED: November 28, 1978

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hellier; Stephen J.	Milan	N/A	N/A	ITX
Passoni; Anselmo G.	Milan	N/A	N/A	ITX

US-CL-CURRENT: 417/48,252/181.4 ,313/561 ,427/255.6 ,427/387 ,428/447

ABSTRACT:

A getter device with an organosilane coating.

19 Claims, 6 Drawing figures

Exemplary Claim Number: 1,9,12

Number of Drawing Sheets: 1

DATE FILED: November 29, 1976

----- KWIC -----

DEPR:

FIG. 3 shows a partial cross-section of a color display tube 30 comprising a shadow mask 31, an electron gun assembly 32 and an iron screening element 33. A first exothermic getter device 10' treated according to the above organosilane process is assembled onto the electron gun. The getter device and electron gun are previously washed in tepid water, which may also contain a small amount of surface active agent. A second getter device 10", again treated according to the above process, is attached to the iron screen 33. The second getter device 10" does not have to be washed but it may remain exposed to the atmosphere and hence humidity for relatively long times before final tube assembly. Furthermore, the second getter device 10" is already attached to iron screen 33 during sealing of the face plate 34 to the cone 35 by means of the hermetic seal 36. This sealing process takes place at 400.degree. C. or more and lasts for 1 hour.

DEPR:

The "Frit test" referred to in the table is an air heat treatment for 1 hour at 420.degree. C. and subsequent "flash" in vacuum. "Explosion" is observed by visual observation of vigorous ejection of glowing particles from the getter device.

US-PAT-NO: 4114080

DOCUMENT-IDENTIFIER: US 4114080 A

TITLE: Explosion simulating device

DATE-ISSUED: September 12, 1978

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Greenwood; Quentin E.	Palos Verdes	CA	90274	N/A
Estates				

US-CL-CURRENT: 446/405,446/454 ,472/64

ABSTRACT:

An electro-mechanical device for simulating an explosion or report is disclosed. A capacitor is charged to a preselected voltage by a battery or a.c. source. A neon lamp indicates when the capacitor has been fully charged. One electrode of the capacitor is coupled to a spark generating grating. The other capacitor electrode is coupled to a movable plunger which makes contact with the grating for generating a spark, explosion and smoke.

10 Claims, 4 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 1

DATE FILED: April 5, 1977

----- KWIC -----

BSPR:

Simulating devices are generally known in the prior art such as toy guns which simulate a gun shot. Some of these toy guns produce a report by mechanical means such as by the sudden motion of the piston within a gun or rifle barrel. The sound generated by a rapid moving piston within the gun barrel. The report generated by such toy gun is not very realistic and there is neither a flash of light nor smoke.

BSPR:

Another example of a toy gun is one that utilizes a cap, a paper container having a small explosive charge, for producing a report. The toy cap gun does generate a loud report but occasionally the caps do not discharge. Also cap guns do not generate a flash of light or smoke which comes from the barrel. Thus cap guns are not realistic either.

BSPR:

Still another example of a toy gun is the type which uses a metal arm rubbing against a rotating abrasive wheel thereby producing a shower of sparks. The limitation of such a device is that a continuous shower of sparks is emitted rather than discrete flashes as an actual gun would emit. In addition some of these toy guns employ a clicking sound effect device for simulating the report. Of course, such a sound effect device provides no realism.

BSPR:

It is another object of the present invention to provide a toy gun for generating a report having realism.

BSPR:

It is yet another object of the present invention to provide a toy gun that is safe for children to operate.

DEPR:

Referring more specifically to FIG. 1 an explosion simulation network 10 includes a power source or supply 12 such as a 110 volt supply or a battery. The power supply 12 may be turned on and off by a double pole single throw switch 14. One pole of the switch 14 is connected to the anode electrode of a diode 16 for controlling the charge current whenever an a.c. power source is used. Thus charging occurs during only the positive half cycle. A variable bias resistor shown here as potentiometer 18 is connected between the cathode electrode of the diode 16 and the second pole of the switch 14. The potentiometer 18 controls the voltage to which the capacitor 30 is charged. The wiper terminal of the potentiometer 18 is connected to the base electrode of a transistor 20 shown here as a modified emitter follower configuration. A current limiting or load resistor 22 is connected between the cathode electrode of the diode 16 and the collector electrode of the transistor 20. One terminal of a resistor 24 is connected to the cathode electrode of the diode 16 while the other terminal is connected to the first electrode of a neon lamp 26. The neon lamp 26 provides a triple function in the circuit. Firstly, when the switch 14 is on, the lamp 26 glowes indicating that there is current flowing through resistor 22 causing a voltage drop thereacross. When the lamp turns off the capacitor is nearly fully charged to its preselected voltage. The lamp 26 may also glow to indicate there is fault in the circuit causing a high current to flow in resistor 22. A voltage divider may be used in lieu of the potentiometer 18. The emitter electrode of the transistor 20 is connected to the first terminal of a storage capacitor 30. The second terminal of the storage capacitor 30, having 2000-3000 microfarad capacity, is connected to the second pole of the switch 14 and to a first conductive contact 32 which is mounted at the muzzle end of a gun barrel 33 of a toy gun or canon. The first electrode of the capacitor 30 is also connected to a plunger rod 34 having a second conductive contact 35 mounted thereon. The capacitor 30 may be any commercially available capacitor such as made by Sprague Electronics.

DEPR:

The barrel 33 may be made of a conductive material such as brass, iron or steel and has a recessed ring at the muzzle end to which the second terminal of the storage capacitor 30 is connected. A coiled metal band forms a contact 32 and is inserted into the recessed ring at the end of the barrel 33. The dielectric annular rings 38 and 39 may be attached to the gun barrel 33 by any convenient method such as cement or having a "press-fit" with the barrel 33. The inside diameter of the rings 37 and 38 should be of sufficiently large size to allow the plunger rod 34 to slide freely back and forth. The plunger 34 has a washer affixed to it for resting against an end of a compression spring 40. The other end of the spring rests against the annular ring 38. The spring 40 automatically returns the rod 34 after the toy gun has been fired. Any other convenient method may be used to return the rod and separate the two contacts

after firing.

DEPR:

A control unit 42 is connected to one end of the plunger 34 for moving the plunger back and forth. The control unit 42 may be any number of convenient means. For example, the rod 34 may be manually moved to make and break contact between the contacts 32 and 35. The control unit 42 may consist of a solenoid which is energized by a sound activated amplifier. A sound activated control unit 42 may be utilized with a burglar alarm system according to the present invention. Alternately, the control unit 42 may be a motor driven cam which activates the rod 34 for repetitive firing. If used in a toy gun the control unit 42 may be the trigger and hammer which strikes the rod 34 moving it forward so that the contact 32 and 35 make electrical connection for discharging the capacitor 30.

DEPR:

Several toys utilizing the circuits described herein have been built. For example, a toy cannon was fitted with the circuit according to FIG. 1 and operated from a 110V a.c. supply and it was found to provide a very realistic report. A battery operated pistol has also been built and tested. A commercially available toy gun was used and a circuit according to the invention was fitted within the gun.

US-PAT-NO: 4033359

DOCUMENT-IDENTIFIER: US 4033359 A

TITLE: Smoking mixture

DATE-ISSUED: July 5, 1977

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Borthwick; James	Glasgow	N/A	N/A	SC
Morman; James Forrester	Troon	N/A	N/A	SC

US-CL-CURRENT: 131/352,131/355

ABSTRACT:

Tobacco based smoking mixture containing a minimum amount of tobacco and a maximum amount of harmless inorganic filler, the composition of the filler having been selected so as to impart a commercially acceptable burning rate to the mixture.

11 Claims, 0 Drawing figures

Exemplary Claim Number: 1

DATE FILED: March 5, 1974

----- KWIC -----

BSPR:

The art of retarding combustion without making a composition **glowproof** yet obtaining the correct puff count from a given weight of smoking mixture by the use of these inert fillers is another key to the success of the invention. Combustion accelerators are combined with combustion retardants in proportions which give a desirable rate of combustion for a particular tobacco and a particular amount thereof incorporated in the mixture. Whilst this principle is exemplified herein and also in our co-pending U.K. Patent Application No. 13860/70 with reference to commonly available inorganic fillers, it can be applied to any inorganic material which proves to be a safe filler for use in a smoking mixture. We have found that a number of commonly available acidic anions influence combustion rate and the order of the retarding ability of a section of them is formate< oxalate< silicate< carbonate=chloride< sulphate<phosphate<borate. Isolated exceptions to these orders indicated can, however, be found. Amongst the cations the order is sodium potassium<calcium<magnesium. With the cations it would appear that their effect on the burning rate depends on their basicity, the most significant change being from calcium to magnesium. This implies, for example, that in smoking mixtures which are identical except that A contains sodium sulphate and B contains the same proportion by weight of magnesium sulphate, A will burn away more quickly. Similarly, in two compositions identical except that A contains calcium carbonate and B contains calcium borate, composition A will burn away more quickly than composition B.

BSPR:

The fillers chosen should not have the power to retain excessive quantities of

water, otherwise glowproofing will result.

DEPR:

The technique of arriving at the composition of a suitable tobacco-based smoking mixture is illustrated in the Table below. Experiments to arrive at the correct puff number employed the technique of balancing the calcium carbonate against the light basic magnesium carbonate content of the mixture. The Table shows that in this instance light basic magnesium carbonate caused glowproofing. The composition listed in the extreme left hand column of this Table constitutes Example 1 of a smoking mixture according to the present invention.

DEPR:

9.6 parts tobacco rag were added to 45.6 parts of water and allowed to soak for 15 minutes, after which time the mixture was transferred to a Probst and Class mill and milled at setting 3 for 10 minutes. The suspension was returned to the stirrer and after the addition of 13.7 parts calcium carbonate, 1.4 parts potassium citrate, 1.4 parts ammonium sulphate, 2.4 parts glycerol, 2.4 parts magnesite and 1.7 parts citric acid, it was stirred for 30 minutes. The batch was then processed in the mill, again at gap setting 2, for 5 minutes and at gap setting zero for 5 minutes. 1.7 parts of locust bean gun and 7.5 parts of water were added at this stage. The slurry was discharged immediately after dispersion of the locust bean gum into a container and stirred for a further 20 minutes. 12.7 parts of water were added to reduce the viscosity to 30,000 cps.

DETL:

Composition Percentage by weight

Tobacco	28	28	28	28	28	28	SCMC	10	10	10	10	10	10	Glycerol	14	14	14	14	14	14
CaCO.sub.3	35	33	31	29	27	25	3MgCO.sub.3	Mg(OH).sub.2	3H.sub.2	O	--	2	4	6	8					
10 K citrate	4	4	4	4	4	4	Citric acid	4	4	4	4	4	4	(NH.sub.4).sub.2	SO.sub.4					
5 5 5 5 5 5							Puff Number	11-12	Extinguished	Would not	Would not	Would not								
Would not	after	remain	remain	light	burn	3-4	puffs	alight	alight											
properly																				

Correct Glow- Puff ##STR1## proofed Number Cigarettes made with the paper used by United Kingdom cigarette manufacturers

US-PAT-NO: 3965608

DOCUMENT-IDENTIFIER: US 3965608 A

TITLE: Manually operated suction device for capturing small objects

DATE-ISSUED: June 29, 1976

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schuman; Mark	Washington	DC	20024	N/A

US-CL-CURRENT: 43/110,124/65 ,15/341 ,15/344 ,228/20.5 ,43/139

ABSTRACT:

A manually operated, manually-powered, hand held suction device for capturing insects, solder, or other small objects by creating and then discharging a stored vacuum. A suction pulse is produced by initially creating a vacuum in an internal storage chamber of the suction device by using a manually operated piston pump, and subsequently creating an instantaneous suction into the muzzle or nozzle of the device and thence into the storage chamber by opening a trigger actuated shutter valve which lies in the barrel between the chamber and the atmosphere. The pump may include two check valves whereby repeated operation of the pump strengthens the stored vacuum. The object is sucked into the valve and toward the chamber where it is stopped by a screen. The object can then be ejected back through the muzzle by reversing the check valves or the direction of motion of the piston, pressurizing the chamber by means of the piston pump, and again pulling the trigger. The shutter valve is operated independently of the pump and can be manually triggered after the operation of the pump has been completed.

62 Claims, 5 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 2

DATE FILED: May 1, 1974

----- KWIC -----

BSPR:

The housing optionally includes an insect attracting device to lure an insect close to the muzzle communicating with the shutter device. This insect attracting device may, for example, be a simple pen-light bulb and battery, phosphorescent material or luminescent paint. The walls of the catch chamber may be transparent such that the presence of the insect or other object may be verified and its condition observed. The catch chamber can be the barrel portion between the shutter valve and a screen or net which blocks the insect and foreign material from entering the internal chamber, check valves or piston cylinder.

BSPR:

To force the insect out, the two check valves are rotated to their reverse position and the pump is used to pressurize, rather than depressurize, the internal chamber means. Upon activation of the triggered shutter, the insect

is blown back out of the gun, through the barrel and muzzle through which it entered. This reverse action also allows the screen, barrel and shutter to be air cleaned. **Water or other liquid may also be drawn into the gun** and ejected for cleaning and other purposes.

DEPR:

As shown in FIGS. 1 and 2, the light attracting device shown in this embodiment is a light source 70. A light bulb 71 is electrically connected to battery 72 which is held in place by spring 74 and removable cap 75. Switch 73 can be used to disconnect the bulb from the battery when light is not required to illuminate **luminescent** paint or other light scattering material on the front surface of funnel 11. An alternate means of attracting insects to the funnel opening 11 is the use of a phosphorescent material on funnel or muzzle 11.

US-PAT-NO: 3829095

DOCUMENT-IDENTIFIER: US 3829095 A

TITLE: METHOD OF EMPLOYING A TELEVISION RECEIVER FOR ACTIVE PARTICIPATION

DATE-ISSUED: August 13, 1974

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Baer, Ralph H.	Manchester	NH	N/A	N/A

US-CL-CURRENT: 463/31,273/237 ,348/121 ,348/553 ,463/2 ,463/40

ABSTRACT:

The present invention pertains to an apparatus and method, in conjunction with standard monochrome and color television receivers, for the generation, display, manipulation, and use of symbols or geometric figures upon the screen of the television receivers for the purpose of training simulation, for playing games, and for engaging in other activities by one or more participants. The invention comprises in one embodiment a control unit, connecting elements and in some applications a television screen overlay mask utilized in conjunction with a standard television receiver. The control unit includes the control, switches and electronic circuitry for the generation, manipulation and control of video signals which are to be displayed on the television screen. The connecting elements couple the video signals to the receiver antenna terminals thereby using existing electronic circuits within the receiver to process and display the signals. An overlay mask which may be removably attached to the television screen may determine the nature of the game to be played or the training simulated. Control units are provided for each of the participants. In the present invention dots are generated on a television screen and controls are provided to cause one dot to overlap the other. Alternatively, a photoelectric element senses light emitted by a displayed dot and denotes that the light has been sensed.

6 Claims, 26 Drawing figures

Number of Drawing Sheets: 11

DATE FILED: August 10, 1970

----- KWIC -----

DEPR:

One game which may be played employing the concepts of this invention is target shooting. A "toy" gun containing a photocell is electrically coupled to the control unit.

DEPR:

Referring now to FIG. 10, initially pressing a reset switch 142 sets the equipment. Reset switch 142 is a double pole single throw switch. The modulation from the coded symbol incident at a photocell 136 is supplied via a buffer amplifier 137, and an amplifier and pulse shaper 138 to a flip-flop 139 which is triggered. The output from flip 139 is applied via a buffer amplifier 141 to a lamp 140 which will light with a steady glow until reset indicating

the correct answer was chosen.

US-PAT-NO: 3771414

DOCUMENT-IDENTIFIER: US 3771414 A

TITLE: APPARATUS FOR A GUN PURGING SYSTEM

DATE-ISSUED: November 13, 1973

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Graham; Alfred R.	Burnt Hills	NY	N/A	N/A

US-CL-CURRENT: 89/1.2,102/700 ,89/14.05 ,89/14.1

ABSTRACT:

The injection of an oxidizing agent into the firing chamber of a gun tube mediatly following the firing of ammunition having a combustible cartridge case provides a relatively large quantity of oxygen to facilitate combustion of any unburned or partially unburned fragments of the case. Hydrogen peroxide is uniquely suited to this application since it may be decomposed into high temperature oxygen and superheated steam; the high temperature oxygen serves as an unusually good oxidizing agent and the superheated steam provides an excellent means for cleaning the internal surfaces of the gun tube.

1 Claims, 1 Drawing figures

Number of Drawing Sheets: 1

DATE FILED: November 26, 1971

----- KWIC -----

BSPR:

The subject approach for solving the problem consists of introducing a strong oxidizing agent into the breech in order to "burn up" the residue. Such an approach is reasonable since the consumable cases are basically fuel rich, and it is known from existing data that the gases remaining in the gun after the projectile leaves are also highly fuel rich. The above hypothesis leads to the following model of the process that occurs in the breech section of a gun employing consumable case type ammunition: The grain is ignited, and at some time later, after combustion is essentially complete, the projectile leaves the gun. At that time, essentially fuel rich gases (by experimental analysis) remain in the breech section of the gun along with the remains and/or residue of the consumable case which is basically a fuel and contains no oxidizer at this time (the virgin material is fuel rich). Since neither the gases nor th remains (residue) of the case contain any oxidizing agent, combustion of the residue ceases; that is, the flame goes out. Later on, when the gun is purged with air the glowing and/or non-glowing residue does not re-ignite and hence must be blown out of the gun. It is apparent that if an oxidizing agent were continuously present during the period when the consumable case should be burning, that the case would burn up as intended.

DEPR:

It is apparent that if an oxidizing agent were continuously present during the period when the combustible case should be burning, the case would burn up as

intended. One solution to the problem is through the use of hydrogen peroxide as a reactive-purge agent. Hydrogen peroxide, particularly in highly concentrated form is known to decompose into high temperature steam and oxygen in the presence of a suitable catalyst. For example, the readily available commercial 90 percent grade of hydrogen peroxide yields high temperature gases (1360.degree.F) containing 42 percent oxygen and 58 percent steam by weight. In such a high temperature environment, there are few combustible materials which will not be rapidly and completely consumed. Furthermore, this grade of hydrogen peroxide will generate a large quantity of hot gas from a relatively small quantity of liquid thereby minimizing the space required to accommodate the system. In fact, each cubic foot of a 90 percent grade of liquid hydrogen peroxide at atmospheric pressure will generate about 5220 cubic feet of hot gas. The hot steam portion of the gas should have the further advantage of cleaning and removing carbon from the interior-gun surface as a result of the water gas reaction. Either of two techniques may be employed for decomposing the hydrogen peroxide:

US-PAT-NO: 3756193

DOCUMENT-IDENTIFIER: US 3756193 A

TITLE: COATING APPARATUS

DATE-ISSUED: September 4, 1973

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Carmichael; Donald C.	Columbus	OH	N/A	N/A
Chambers; Douglas L.	Columbus	OH	N/A	N/A

US-CL-CURRENT: 118/726,204/192.11 ,204/298.05

ABSTRACT:

Apparatus for providing a tightly adherent coating on a substrate comprising a first chamber, means for providing an ionizable gas such as argon to the first chamber, a cathode comprising the substrate in the first chamber, a second chamber adjacent to the first chamber, a wall between the first chamber and the second chamber, an anode comprising a supply of the coating material, an exposed surface portion of the material (approximately planar and parallel to the wall) being in the first chamber and spaced from the cathode, a source of electrons in the second chamber, means for directing electrons from the source in a beam through an opening in the wall and on to the exposed surface portion of the anode, means for substantially evacuating the second chamber, and means for providing the cathode with a negative electric potential relative to the anode.

The electron directing means comprises an electron beam gun that directs the electron beam initially in a direction approximately parallel to the wall and away from the exposed anode surface portion, bends the beam through approximately one right angle to pass through the opening, and then bends it through approximately two more right angles to strike the exposed anode surface portion in a direction approximately perpendicular to the exposed anode surface portion.

13 Claims, 4 Drawing figures

Number of Drawing Sheets: 1

DATE FILED: May 1, 1972

----- KWIC -----

BSPR:

Ion plating is a technique of vacuum coating, newer than vacuum evaporation (metallizing) and sputtering. In ion plating, the part to be coated is made the negative electrode or is placed in a low-pressure (vacuum) dc glow discharge, usually of argon. The positive ions from the discharge are accelerated by an electric field and bombard the surface of the part, continuously cleaning it before and during deposition. The coating material is then evaporated into the gaseous discharge, where it is ionized. The coating-material ions in the glow discharge region, which surrounds the part, are accelerated to all surfaces of the part across the cathode (Crookes) dark

space (between the glow discharge region and the part). Because the dark space has across it most of the field gradient (voltage drop) of the discharge, the ions deposit on the surfaces of the part with high energy, typically forming a very adherent coating.

BSPR:

D. Because the coating-material ions are created throughout the glow discharge surrounding the part, the method has very good throwing power, and quite uniform coatings can be deposited by ion plating without rotating the part. Build-up at corners of parts also is not encountered in this process.

BSPR:

An interesting application of ion plating for coating high-strength steel, titanium, and aluminum alloy fasteners with pure aluminum alloy fasteners with pure aluminum for corrosion protection in marine environments is described in McCrary, L. E., Carpenter, J. F., and Klein, A. A., Specialized Application of Vapor-Deposited Films, Transactions of the International Vacuum Metallurgy Conference - 1968, American Vacuum Society, New York, N. Y., 1968. This work included demonstration of the deposition of uniform and adherent film on screw threads, without any build-up at the thread crown. Spalvins, et al, have reported some useful descriptions of ion-plated coatings on complex shapes and of ion-plated coatings of several alloys deposited using flash evaporation in Spalvins, T., Przybyszewski, J. S., and Buckley, D. W., Deposition of Thin Films by Ion Plating on Surfaces Having Various Configurations, Report No. NASA-TN-D-3707, July 26, 1966; and in Spalvins, T., Deposition of Alloy Films on Complex Surfaces by Ion Plating With Flash Evaporation, Report No. N70-32006, June, 1970. Gold coatings 1300 to 1500 Angstroms thick were deposited on components of a ball bearing and several other complex shapes. Strong bonding of the coatings to the substrates and excellent uniformity were obtained. The alloy coatings which were ion plated using flash evaporation to vaporize the materials into the glow discharge were lead-tin and copper-gold compositions. The original compositions of the alloys were closely maintained in the deposit using this technique and very good adherence and uniformity were achieved. In these and other references on the process, it is noted, however, that the range of materials that have been ion plated is rather limited and relatively little information is reported on the relationship of the processing variables involved in ion plating.

DEPR:

The electron-beam gun 22 was a rod-fed, 10 kw, single position, 270.degree. beam source (Airco Temescal Model RIH-270). This gun utilizes X and Y water-cooled deflection coils with flush magnetic poles, a 270.degree. deflected beam for increased filament life, a water-cooled copper hearth, and rod feeding (as indicated at 18, 37, 29) to the source. It employs a six-turn, 0.030-in.-diameter, tungsten filament and produces an arrow head spot (generally triangular) 3/16 to 1/4 in. long, depending on the filament-to-beam-former spacing and on the size of the orifice 24 in the wall or conductance baffle 13 where the beam 23 enters the glow discharge region 38 in the first chamber 11. For process coating applications, the rod-fed type of mechanism 37 was chosen to feed the electron beam evaporating source rod 18. The rod feeder 37 is mechanically driven by the feed drive 29 and contains the source material 18 (for the coating 20) which is nominally 1 in. diameter and

10 in. long. This method provides a large inventory of evaporant for continuous operation and provides precise control of the height of the melting pool 19.

DEPR:

To achieve a coating with the desired characteristics, five parameters require control: glow discharge pressure; evaporant flux (electron beam power); substrate voltage and current; source-to-substrate distance; and substrate geometry. The glow discharge pressure and the evaporant flux are the foremost parameters to be considered for the ion plating process. They affect both the ion deposition efficiency and the uniformity of the coating. The discharge pressure was investigated from 1 to 30 microns under various conditions. The evaporant flux was measured in terms of the electron beam power applied to the vapor source and was investigated from 1 to 10 kw.

DEPR:

The substrate-to-source distance was held constant at 6.5 inches normal to the source. The substrate voltage generally was 2000 volts dc; but was varied from 800 to 2000 volts in some experiments as shown in the appropriate data. The substrate current density depended on the glow discharge pressure that was used in each experiment and was in the range of from 0.4 to 0.6 ma/cm.^{sup.2}.

DEPR:

The typical structure of gold deposited on copper shows a clean interface that gives strong adherence that withstands a typical tape test. Micrographs show excellent coating uniformity around corners, with no build-up at corners, in contrast with coatings from other processes. The microstructure of stainless steel on copper shows a clean interface and a high-density deposit. Excellent adhesion was obtained with deposition at 12 mils per hour at 20 microns and substrate at 2000 volts. Micrographs show also that a FeCrAlY alloy adheres well on a TD nickel substrate. Deposition at 4.5 mils per hour at 20 microns produces a fine grain structure, even finer structures can be obtained at different rates or by heating substrate. Other examples of ion plated parts include turbine blades with 3 to 15 mils of FeCrAlY alloy, copper hemispheres with 1 mil 304 stainless steel, titanium honeycombs with 1/2 to 1 of gold and aluminum, and rf conduits and pulleys with 1 mil of stainless steel. Insulators ion plated in a wire cage include porcelain, Al._{sub.2} O._{sub.3}, and BeO, all coated with stainless steel. The cage forms an electric field around the insulators during deposition to accelerate coating ions to the surface of each part. Glow discharge cleaning before the ion plating yields excellent coating adherence.

US-PAT-NO: 3751846

DOCUMENT-IDENTIFIER: US 3751846 A

TITLE: CHEMILUMINESCENT TOY

DATE-ISSUED: August 14, 1973

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Benjamin, Sr.; Louis E.	Livingston	NJ	N/A	N/A

US-CL-CURRENT: 446/197,252/700 ,362/34 ,446/219

ABSTRACT:

A toy which emits chemiluminescent light at a specific location in response to the squeezing of a flexible bulb, or the temporary local creation of pressure. The light in the toy may be produced behind the eyes of a toy animal, or at any decorative spot on the toy. The light produced may be used for signal purposes or for the purpose of simulating rays or beams of radiation.

The chemiluminescent light is produced by combining a gas formed in a squeeze bottle with a wick or pad which is soaked in a fluorescent chemical.

7 Claims, 3 Drawing figures

Number of Drawing Sheets: 1

DATE FILED: May 8, 1972

----- KWIC -----

TTL:

CHEMILUMINESCENT TOY

ABPL:

A toy which emits chemiluminescent light at a specific location in response to the squeezing of a flexible bulb, or the temporary local creation of pressure. The light in the toy may be produced behind the eyes of a toy animal, or at any decorative spot on the toy. The light produced may be used for signal purposes or for the purpose of simulating rays or beams of radiation.

ABPL:

The chemiluminescent light is produced by combining a gas formed in a squeeze bottle with a wick or pad which is soaked in a fluorescent chemical.

BSPR:

This invention relates to a means of producing chemiluminescent light at a specific location on a toy, said light being produced in response to the temporary application of pressure on a flexible squeeze bulb.

BSPR:

The chemiluminescent light is produced in a pad or wick which has been moistened with a fluorescent chemical such as rubrene, or diphenylanthracene

and on which a vapor has been sprayed. The vapor is formed in a squeeze bottle in which a solution of hydrogen peroxide in dimethylphthalate is activated by a small quantity of dinitrophenyl oxalate ester.

DEPR:

Turning now descriptively to the drawing, in which similar reference characters denote similar elements throughout the several views, FIG. 1 illustrates the apparatus for producing chemiluminescent light in a wad 10 of cotton which has been soaked in a solution of a fluorescent chemical. The wad 10 is enclosed at the end of a cylindrical tube 17 in a concave cup 14 with a transparent end housing 13 through which the cold light produced is visible. End housing 13 may be located in an animal toy so as to simulate the eye of the toy animal.

DEPR:

Where the cold light is desired in the form of a ray as in a toy laser gun, the wad of cotton may be wrapped in the form of a filament 12 inside the tube 22 about a length of aluminum foil.

CLPR:

1. A toy in which chemiluminescent light is produced to represent a source of light in the toy, said chemiluminescent light occurring when a flexible squeeze bulb attached to a bottle is compressed to force the reactant vapors in said bottle into contact with a wad of porous material which is soaked with a fluorescent chemical, the gas space of said squeeze bottle being connected by tubing to the transparent container in which the wad of porous material is located.

US-PAT-NO: 3728480

DOCUMENT-IDENTIFIER: US 3728480 A

TITLE: TELEVISION GAMING AND TRAINING APPARATUS

DATE-ISSUED: April 17, 1973

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Baer, Ralph H.	Manchester	NH	N/A	N/A

US-CL-CURRENT: 463/5,273/237 ,331/113R ,331/116R ,331/117R ,340/323R ,345/180 ,434/323 ,463/37

ABSTRACT:

The present invention pertains to an apparatus and method, in conjunction with standard monochrome and color television receivers, for the generation, display, manipulation, and use of symbols or geometric figures upon the screen of the television receivers for the purpose of training simulation, for playing games, and for engaging in other activities by one or more participants. The invention comprises in one embodiment a control unit, connecting means and in some applications a television screen overlay mask utilized in conjunction with a standard television receiver. The control unit includes the control means, switches and electronic circuitry for the generation, manipulation and control of video signals which are to be displayed on the television screen. The connecting means couples the video signals to the receiver antenna terminals thereby using existing electronic circuits within the receiver to process and display the signals. An overlay mask which may be removably attached to the television screen may determine the nature of the game to be played or the training simulated. Control units are provided for each of the participants. Alternatively, games, training simulations and other activities may be carried out in conjunction with background and other pictorial information originated in the television receiver by commercial TV, closed-circuit TV or a CATV station.

46 Claims, 26 Drawing figures

Number of Drawing Sheets: 11

DATE FILED: March 22, 1971

----- KWIC -----

DEPR:

One game which may be played employing the concepts of this invention is target shooting. A "toy" gun containing a photocell is electrically coupled to the control unit.

DEPR:

Referring now to FIG. 10, initially pressing a reset switch 142 sets the equipment. Reset switch 142 is a double pole single throw switch. The modulation from the coded symbol incident at a photocell 136 is supplied via a buffer amplifier 137, and an amplifier and pulse shaper 138 to a flip-flop 139 which is triggered. The output from flip 139 is applied via a buffer amplifier

141 to a lamp 140 which will light with a steady glow until reset indicating the correct answer was chosen.

CLPR:

20. The combination of claim 19 wherein said light sensing means is a photosensitive element arranged within the barrel of a toy gun.

US-PAT-NO: 3573845

DOCUMENT-IDENTIFIER: US 3573845 A

TITLE: IMPROVED ACOUSTIC IMAGE REPRODUCTION SYSTEM USING A
PIEZOELECTRIC

PRINTER AND ELECTROGASDYNAMICS

DATE-ISSUED: April 6, 1971

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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Gourdine; Meredith C.	West Orange	NJ	N/A	N/A
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US-CL-CURRENT: 347/125,310/311 ,347/158 ,369/16

ABSTRACT:

An apparatus and method for printing an image of a pattern of sound waves on a dielectric sheet, such as paper or the like, comprising the use of a space charge cloud of ionized ink from an electrogasdynamic generator to develop an electrostatic charge image of the sound pattern which has been formed on the dielectric sheet using an acoustic image converter plate. By virtue of the high charge on the ink, a high quality image is developed on the sheet even though the sound wave patterns resulting from ultrasonic scanning of a test object or from the energizing of an acoustical transducer may be comparatively weak.

10 Claims, 4 Drawing figures

Number of Drawing Sheets: 1

DATE FILED: February 27, 1969

----- KWIC -----

DEPR:

As a result of the even distribution of charged ink, fringing effects are avoided at the areas of greatest contrast and as the highly charged particles will avoid those areas already charged to maximum potential, an image with improved definition and resolution is developed. A variety of inks, toners or paints may be used in this process due to the versatility of the EGD spray gun in charging aerosols and the use of water based inks is particularly of advantage in avoiding air pollution problems during the subsequent fixing step if one is desired.

DEPR:

FIG. 3 shows an alternate form of image converter utilizing semiconductors and thin films. This converter comprises a thin conductive metal film 21, a layer of piezoelectric and possibly rectifying semiconductor material 22 exhibiting highly lateral resistivity, dots of independent, electroluminescent material 23 and another thin transparent metallic coating 24. A sound wave picture striking the conductive film 21 is converted to a pattern of electric currents moving through each tiny area of the semiconductor 22. These currents may be intrinsically amplified by various arrangements. Arriving at the luminescent dots 23, the currents cause each dot to glow with an intensity proportional to

the strength of the exciting current. Ultimately this current strength is determined by the sound strength of each small area of the arriving sound wave pattern. Thus, the sound pattern is converted to a visual picture without the use of complex cathode ray tubes or other devices. The resulting visual picture may be printed in the manner of the present invention by using it in combination with a xerographic plate 25 to produce a corresponding charged surface image. The xerographic plate 25 may then be substituted for the piezoelectric plate 4 in the system of FIG. 1. Other methods and apparatus for developing the charge image on the surface of the xerographic plate 25 are more fully disclosed in my copending application, Ser. No. 763,722, filed Sept. 30, 1968, and assigned to the same assignee as the present application.

	L #	Hits	Search Text	DBs	Time Stamp
1	L1	7170	biolumines\$ or fluorescen\$ near4 protein\$1 or luciferase\$1 or photoprotein\$1	USPAT; US-PGPUB	2002/05/08 12:24
2	L2	2157	gun near5 (toy or squirt or water)	USPAT; US-PGPUB	2002/05/08 12:25
3	L3	8	1 and 2	USPAT; US-PGPUB	2002/05/08 12:25
4	L4	53179	chemilumines\$ or lumines\$8 or glow\$8	USPAT; US-PGPUB	2002/05/08 12:25
5	L5	58	(4 and 2) not 1	USPAT; US-PGPUB	2002/05/08 12:26
6	L6	62616	toy or novelty	USPAT; US-PGPUB	2002/05/08 12:26
7	L7	91	6 and 1	USPAT; US-PGPUB	2002/05/08 12:26
8	L8	11	6 same 1	USPAT; US-PGPUB	2002/05/08 12:27
9	L9	5	8 not 3	USPAT; US-PGPUB	2002/05/08 12:27

PGPUB-DOCUMENT-NUMBER: 20010036073
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010036073 A1

TITLE: Carvable decorative gourd

PUBLICATION-DATE: November 1, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Trease, Christine K.	Price	UT	US	

US-CL-CURRENT: 362/154,362/122 ,362/124 ,362/808

ABSTRACT:

An artificial hollow carvable gourd shaped as a pumpkin, squash, or other fruit or vegetable, having an outer carvable shell, which encases fake "innards and seeds" made of edible candy, and including a prize, contained therein to provide a more realistic gourd container.

DATE FILED: April 19, 2001

----- KWIC -----

BSTX:

[0007] Cited for general interest is Bryan, U.S. Pat. No. 5,876,995, which discloses **bioluminescent novelty** items, which can have a Halloween theme.

US-PAT-NO: 6245427

DOCUMENT-IDENTIFIER: US 6245427 B1

TITLE: Non-ligand polypeptide and liposome complexes as intracellular delivery vehicles

DATE-ISSUED: June 12, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Duzgunes; Nejat	Mill Valley	CA	94941	N/A
Simoes; Sergio	3000 Coimbra	N/A	N/A	PTX
Slepushkin; Vladimir	Coralville	IA	52241	N/A
Pedras de Lima; Maria C.	3000 Coimbra	N/A	N/A	PTX

US-CL-CURRENT: 428/402.2,424/9.321 ,435/458 ,530/350 ,530/363 ,536/23.1

ABSTRACT:

The present invention discloses compositions and methods of using intracellular delivery vehicles for delivery and transfection of DNA, RNA, polypeptides, genes, proteins, drugs and biologically active agents into cells in vitro and in vivo. The vehicle comprises a mixture of a liposome and a polypeptide lacking specificity for cellular receptors. In another embodiment, a method for intracellular delivery of biologically active agents comprising combining a non-receptor-binding protein and a liposome, incubating the mixture for a period of time, adding the biologically active agent, incubating again, and finally, introducing the resulting mixture to the cell. Preferably, the liposome is a cationic liposome. The charge ratio of cationic liposome to DNA can effectively be varied from 2:1 to 1:2. Preferably, the non-receptor-binding protein is the serum albumin of the animal source of the cell to be transfected. This invention is an improvement over, and offers several advantages compared to, previously disclosed cationic liposomal delivery vehicles which utilize receptor ligands.

41 Claims, 9 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 9

DATE FILED: July 6, 1998

----- KWIC -----

DEPR:

These results suggest that a correlation between transfection activity (level of luciferase expression) and transfection efficiency (the percentage of cells transfected) can be established in this system. It should be noted that the experiments were not designed to maximize the efficiency of transfection, but to explore the ability to use non-ligand proteins such as HSA, along with various +/--charge ratios, in transfection activity. Therefore, the efficiency of transfection shown herein may not reflect the utility or novelty of the invention.

US-PAT-NO: 5931383

DOCUMENT-IDENTIFIER: US 5931383 A

TITLE: Self-illuminated drinking straw

DATE-ISSUED: August 3, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Palmer; William R.	Cameron Park	CA	N/A	N/A
Palmer; Stephen L.	Cameron Park	CA	N/A	N/A

US-CL-CURRENT: 239/33

ABSTRACT:

The instant invention provides for illuminated drinking straws which employ chemiluminescent mixtures as lighting sources. The illuminated drinking straw may be used with either hot or cold beverage such as water, fruit juices, soft drinks, coffees and teas, milk products or alcoholic beverages. A new and exciting drinking straw for amusement purposes is intended.

24 Claims, 23 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 12

DATE FILED: February 3, 1998

----- KWIC -----

BSPR:

Other non-incandescent, chemical means of producing light which may be advantageously employed include bioluminescent systems, or alternately, chemiluminescent systems based on dioxetanes or other chemiluminescent reagents. Toy and novelty applications which utilizes bioluminescent systems are taught in PCT-WO 97/29319.

US-PAT-NO: 5554035

DOCUMENT-IDENTIFIER: US 5554035 A

TITLE: Bioluminescent algae in light bulb shaped viewing device

DATE-ISSUED: September 10, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gooch; Van D.	Morris	MN	56267	N/A

US-CL-CURRENT: 434/297,119/245

ABSTRACT:

The present invention relates to an apparatus for viewing luminescence of algae. The apparatus comprises bioluminescent, dinoflagellate algae, an aqueous solution in which the bioluminescent algae can live, and a translucent light bulb shaped container for holding the bioluminescent algae in the aqueous solution.

8 Claims, 1 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 1

DATE FILED: July 1, 1994

----- KWIC -----

BSPR:

The present invention relates generally to an educational and **novelty** device for viewing **bioluminescent** algae. In particular, the present invention relates to a light bulb shaped viewing device containing **bioluminescent** algae.

DEPR:

The preferred algae, Pyrocystis, used in the present invention have never been implicated as one of the dinoflagellates involved in shell fish poisoning as described by Karen A. Steidinger & Daniel G. Baden, Toxic Marine Dinoflagellates, in DINOFLAGELLATES 201-61 (David Spector, ed., 1984). If one drank a culture of the dinoflagellates from the device of the present invention, it is highly unlikely that there would be a sufficiently high concentration of toxins to have a detrimental effect. For purposes of incorporating the **bioluminescent** algae into a **novelty** item, no species that was known to be involved in shell fish poisoning is used.

US-PAT-NO: 5403221

DOCUMENT-IDENTIFIER: US 5403221 A

TITLE: Aerial toy with short axis rotational ascent and long axis rotational descent

DATE-ISSUED: April 4, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Savage; Daniel	San Jose	CA	95125	N/A

US-CL-CURRENT: 446/45,446/36

ABSTRACT:

An aerial toy designed to maintain an aerodynamic profile during ascent by rotating around its shortest axis and having a shape which naturally predicts it to rotate around its longest axis during descent. The body of the invention consists of generally flat, thin, and lightweight, rigid construction (10) with an aerodynamic tapering edge (12). The body has a height that is longer than its width, and one half of the body height has more surface area than the other half.

13 Claims, 6 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: July 13, 1993

----- KWIC -----

CLPR:

11. The aerial toy of claim 10 wherein said lighting means is chosen from the group consisting of bioluminescent chemicals, luminescent paint, and light emitting diodes.

	L #	Hits	Search Text	DBs	Time Stamp
1	L1	7170	biolumines\$ or fluorescen\$ near4 protein\$1 or luciferase\$1 or photoprotein\$1	USPAT; US-PGPUB	2002/05/08 12:24
2	L2	2157	gun near5 (toy or squirt or water)	USPAT; US-PGPUB	2002/05/08 12:25
3	L3	8	1 and 2	USPAT; US-PGPUB	2002/05/08 12:25
4	L4	53179	chemilumines\$ or lumines\$8 or glow\$8	USPAT; US-PGPUB	2002/05/08 12:25
5	L5	58	(4 and 2) not 1	USPAT; US-PGPUB	2002/05/08 12:26
6	L6	62616	toy or novelty	USPAT; US-PGPUB	2002/05/08 12:26
7	L7	91	6 and 1	USPAT; US-PGPUB	2002/05/08 12:26
8	L8	11	6 same 1	USPAT; US-PGPUB	2002/05/08 12:27
9	L9	5	8 not 3	USPAT; US-PGPUB	2002/05/08 12:27
10	L10	13	1 and toy	USPAT; US-PGPUB	2002/05/08 12:33
11	L11	6	10 not 3	USPAT; US-PGPUB	2002/05/08 12:29
12	L12	16	1 and novelty adj item\$1	USPAT; US-PGPUB	2002/05/08 12:34

PGPUB-DOCUMENT-NUMBER: 20020025553
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020025553 A1

TITLE: Transforming growth factor alpha HIII

PUBLICATION-DATE: February 28, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Wei, Ying-Fei	Berkeley	CA	US	

US-CL-CURRENT: 435/69.1,435/325 ,435/7.1 ,530/399 ,536/23.5

ABSTRACT:

The present invention relates to a novel human protein called Transforming Growth Factor Alpha III, and isolated polynucleotides encoding this protein. Also provided are vectors, host cells, antibodies, and recombinant methods for producing this human protein. The invention further relates to diagnostic and therapeutic methods useful for diagnosing and treating disorders related to this novel human protein.

DATE FILED: December 1, 2000

----- KWIC -----

DETX:

[0123] Additional preferred polypeptide fragments comprise, or alternatively consist of, the amino acid sequence of residues: M-1 to W-15; A-2 to A-16; P-3 to A-17; H-4 to A-18; G-5 to L-19; P-6 to L-20; G-7 to L-21; S-8 to A-22; L-9 to L-23; T-10 to G-24; T-11 to V-25; L-12 to E-26; V-13 to R-27; P-14 to A-28; W-15 to L-29; A-16 to A-30; A-17 to L-31; A-18 to P-32; L-19 to E-33; L-20 to 1-34; L-21 to C-35; A-22 to T-36; L-23 to Q-37; G-24 to C-38; V-25 to P-39; E-26 to G-40; R-27 to S-41; A-28 to V-42; L-29 to Q-43; A-30 to N-44; L-31 to L-45; P-32 to S-46; E-33 to K-47; 1-34 to V-48; C-35 to A-49; T-36 to F-50; Q-37 to Y-51; C-38 to C-52; P-39 to K-53; G-40 to T-54; S-41 to T-55; V-42 to R-56; Q-43 to E-57; N-44 to L-58; L-45 to M-59; S-46 to L-60; K-47 to H-61; V-48 to A-62; A-49 to R-63; F-50 to C-64; Y-51 to C-65; C-52 to L-66; K-53 to N-67; T-54 to Q-68; T-55 to K-69; R-56 to G-70; E-57 to T-71; L-58 to 1-72; M-59 to L-73; L-60 to G-74; H-61 to L-75; A-62 to D-76; R-63 to L-77; C-64 to Q-78; C-65 to N-79; L-66 to C-80; N-67 to S-81; Q-68 to L-82; K-69 to E-83; G-70 to D-84; T-71 to P-85; 1-72 to G-86; L-73 to P-87; G-74 to N-88; L-75 to F-89; D-76 to H-90; L-77 to Q-91; Q-78 to A-92; N-79 to H-93; C-80 to T-94; S-81 to T-95; L-82 to V-96; E-83 to I-97; D-84 to 1-98; P-85 to D-99; G-86 to L-100; P-87 to Q-101; N-88 to A-102; F-89 to N-103; H-90 to P-104; Q-91 to

L-105; A-92 to K-106; H-93 to G-107; T-94 to D-108; T-95 to L-109; V-96 to A-110; I-97 to N-111; I-98 to T-112; D-99 to F-113; L-100 to R-114; Q-101 to G-115; A-102 to F-116; N-103 to T-117; P-104 to Q-118; L-105 to L-119; K-106 to Q-120; G-107 to T-121; D-108 to L-122; L-109 to I-123; A-110 to L-124; N-111 to P-125; T-112 to Q-126; F-113 to H-127; R-114 to V-128; G-115 to N-129; F-116 to C-130; T-117 to P-131; Q-118 to G-132; L-119 to G-133; Q-120 to I-134; T-121 to N-135; L-122 to A-136; I-123 to W-137; L-124 to N-138; P-125 to T-139; Q-126 to I-140; H-127 to T-141; V-128 to S-142; N-129 to Y-143; C-130 to I-144; P-131 to D-145; G-132 to N-146; G-133 to Q-147; I-134 to I-148; N-135 to C-149; A-136 to Q-150; W-137 to G-151; N-138 to Q-152; T-139 to K-153; I-140 to N-154; T-141 to L-155; S-142 to C-156; Y-143 to N-157; I-144 to N-158; D-145 to T-159; N-146 to G-160; Q-147 to D-161; I-148 to P-162; C-149 to E-163; Q-150 to M-164; G-151 to C-165; Q-152 to P-166; K-153 to E-167; N-154 to N-168; L-155 to G-169; C-156 to S-170; N-157 to C-171; N-158 to V-172; T-159 to P-173; G-160 to D-174; D-161 to G-175; P-162 to P-176; E-163 to G-177; M-164 to L-178; C-165 to L-179; P-166 to Q-180; E-167 to C-181; N-168 to V-182; G-169 to C-183; S-170 to A-184; C-171 to D-185; V-172 to G-186; P-173 to F-187; D-174 to H-188; G-175 to G-189; P-176 to Y-190; G-177 to K-191; L-178 to C-192; L-179 to M-193; Q-180 to R-194; C-181 to Q-195; V-182 to G-196; C-183 to S-197; A-184 to F-198; D-185 to S-199; G-186 to L-200; F-187 to L-201; H-188 to M-202; G-189 to F-203; Y-190 to F-204; K-191 to G-205; C-192 to I-206; M-193 to L-207; R-194 to G-208; Q-195 to A-209; G-196 to T-210; S-197 to T-211; F-198 to L-212; S-199 to S-213; L-200 to V-214; L-201 to S-215; M-202 to I-216; F-203 to L-217; F-204 to L-218; G-205 to W-219; I-206 to A-220; L-207 to T-221; G-208 to Q-222; A-209 to R-223; T-210 to R-224; T-211 to K-225; L-212 to A-226; S-213 to K-227; V-214 to T-228; S-215 to S-229 of SEQ ID NO:2. These polypeptide fragments may retain the biological activity of TGF alpha HIII polypeptides of the invention and/or may be useful to generate or screen for antibodies, as described further below. Polynucleotides encoding these polypeptide fragments are also encompassed by the invention.

DETX:

[0198] The present invention further encompasses antibodies or fragments thereof conjugated to a diagnostic or therapeutic agent. The antibodies can be used diagnostically to, for example, monitor the development or progression of a tumor as part of a clinical testing procedure to, e.g., determine the efficacy of a given treatment regimen. Detection can be facilitated by coupling the antibody to a detectable substance. Examples of detectable substances include various enzymes, prosthetic groups, fluorescent materials, luminescent materials, bioluminescent materials, radioactive materials, positron emitting metals using various positron emission tomographies, and nonradioactive paramagnetic metal ions. The detectable substance may be coupled or conjugated either directly to the antibody (or fragment thereof) or indirectly, through an intermediate (such as, for example, a linker known in the art) using techniques known in the art. See, for example, U.S. Pat. No. 4,741,900 for metal ions which can be conjugated to antibodies for use as diagnostics according to the present invention. Examples of suitable enzymes include horseradish peroxidase, alkaline phosphatase, beta-galactosidase, or acetylcholinesterase; examples of suitable prosthetic group complexes include streptavidin/biotin and avidin/biotin; examples of suitable fluorescent materials include umbelliferone, fluorescein, fluorescein isothiocyanate, rhodamine, dichlorotriazinylamine fluorescein, dansyl chloride or phycoerythrin; an example of a luminescent material includes luminol; examples

of **bioluminescent** materials include **luciferase**, luciferin, and aequorin; and examples of suitable radioactive material include ¹²⁵I, ¹³¹I, ¹¹¹In or ⁹⁹Tc.

DETX:

[0714] With this GAS promoter element linked to the SV40 promoter, a GAS:SEAP2 reporter construct is next engineered. Here, the reporter molecule is a secreted alkaline phosphatase, or "SEAP." Clearly, however, any reporter molecule can be instead of SEAP, in this or in any of the other Examples. Well known reporter molecules that can be used instead of SEAP include chloramphenicol acetyltransferase (CAT), **luciferase**, alkaline phosphatase, B-galactosidase, green fluorescent protein (GFP), or any protein detectable by an antibody.

PGPUB-DOCUMENT-NUMBER: 20020009455
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020009455 A1

TITLE: DNA encoding a novel PROST 03 polypeptide

PUBLICATION-DATE: January 24, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lau, Ted	Alameda	CA	US	
Lin, Richard J.	Danville	CA	US	
Parkes, Deborah	Hayward	CA	US	
Parry, Gordon	Walnut Creek	CA	US	
Schneider, Douglas W.	Lafayette	CA	US	
Steinbrecher, Renate	Walnut Creek	CA	US	
Heuit, Pamela <u>Toy</u> Van	Moraga	CA	US	
Wu, John	Carlisle	MA	US	

US-CL-CURRENT: 424/178.1,435/325 ,435/6 ,435/69.1 ,435/7.23 ,530/350

ABSTRACT:

The present invention relates to novel human polypeptides, designated PROST 03, which exhibit an expression pattern showing a high specificity toward prostate tissues, polynucleotides encoding the polypeptides, methods for producing the polypeptides, expression vectors and genetically engineered host cells for expression of the polypeptides. The invention further relates to methods for utilizing the polynucleotides and polypeptides in research, diagnosis, and therapeutic applications.

DATE FILED: April 20, 2001

----- KWIC -----

INNM:

Heuit, Pamela Toy Van

DETX:

[0189] The PROST 03 antibodies of the invention may be labeled with a detectable marker or conjugated to a second molecule, such as a cytotoxic agent, and used for targeting the second molecule to a PROST 03 positive cell (Vitetta, E. S. et al., Immunotoxin Therapy, in DeVita, Jr, V. T. et al., eds, Cancer: Principles and Practice of Oncology, 4.sup.th ed., J. B. Lippincott Co., Philadelphia, 2624-2636, 1993) Examples of cytotoxic agents include, but are not limited to ricin, doxorubicin, daunorubicin, taxol, ethidium bromide,

05/08/2002, EAST Version: 1.03.0002

PGPUB-DOCUMENT-NUMBER: 20010036073
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010036073 A1

TITLE: Carvable decorative gourd

PUBLICATION-DATE: November 1, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Trease, Christine K.	Price	UT	US	

US-CL-CURRENT: 362/154,362/122 ,362/124 ,362/808

ABSTRACT:

An artificial hollow carvable gourd shaped as a pumpkin, squash, or other fruit or vegetable, having an outer carvable shell, which encases fake "innards and seeds" made of edible candy, and including a prize, contained therein to provide a more realistic gourd container.

DATE FILED: April 19, 2001

----- KWIC -----

BSTX:

[0007] Cited for general interest is Bryan, U.S. Pat. No. 5,876,995, which discloses bioluminescent novelty items, which can have a Halloween theme.

BSTX:

[0008] None of these references provides a decorative container having candy and toy innards, having the weight and feel of a natural pumpkin or guard, which can be carved and decorated after the container is opened. The invention described below provides such an invention.

DETX:

[0030] The carvable gourd container 10 thus provides an ideal candy container convertible into a toy or novelty item suitable for decorative holiday use or play.

US-PAT-NO: 5931383

DOCUMENT-IDENTIFIER: US 5931383 A

TITLE: Self-illuminated drinking straw

DATE-ISSUED: August 3, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Palmer; William R.	Cameron Park	CA	N/A	N/A
Palmer; Stephen L.	Cameron Park	CA	N/A	N/A

US-CL-CURRENT: 239/33

ABSTRACT:

The instant invention provides for illuminated drinking straws which employ chemiluminescent mixtures as lighting sources. The illuminated drinking straw may be used with either hot or cold beverage such as water, fruit juices, soft drinks, coffees and teas, milk products or alcoholic beverages. A new and exciting drinking straw for amusement purposes is intended.

24 Claims, 23 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 12

DATE FILED: February 3, 1998

----- KWIC -----

BSPR:

Other non-incandescent, chemical means of producing light which may be advantageously employed include bioluminescent systems, or alternately, chemiluminescent systems based on dioxetanes or other chemiluminescent reagents. Toy and novelty applications which utilizes bioluminescent systems are taught in PCT-WO 97/29319.

US-PAT-NO: 5840338

DOCUMENT-IDENTIFIER: US 5840338 A

TITLE: Loading of biologically active solutes into polymer gels

DATE-ISSUED: November 24, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Roos; Eric J.	Grafton	MA	01519	N/A
Schiller; Matthew E.	Waltham	MA	02154	N/A

US-CL-CURRENT: 424/488,424/484 ,424/486 ,424/487 ,514/944 ,516/99

ABSTRACT:

Polymer gel networks loaded with biologically active solutes in a manner that solute activity is maintained and protected from thermal and/or chemical degradation while in the gel network are provided. The invention also provides for effects of modulating parameters for loading safe responsive gel networks using loading solutions containing phase separating polymers.

29 Claims, 25 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 12

DATE FILED: November 6, 1995

----- KWIC -----

BSPR:

It has now been discovered that biologically active solutes such as proteins, polypeptides, nucleoproteins, glycoproteins and lipoproteins can be loaded into safe, responsive crosslinked polysaccharide gel networks and demonstrate activity after exposure to thermal and chemical challenges. Applications for loaded biologically active solutes into safe, responsive crosslinked polysaccharide gel networks include, but are not limited to, cosmetic formulations using papain, therapeutics such as peroxidase catalyzed antibacterials or oral hepatitis B vaccine, over the counter products using peroxidase catalyzed antibacterials in mouthwash or toothpaste that require protection of an enzyme from formulation excipients such as sodium dodecyl sulfate, lactose intolerance medications, stabilization of molecular biology enzymes such as restriction endonucleases allowing for greater shipping and storage flexibility with respect to temperature, loading of enzymes into gel networks for use in blood panel diagnostics or other types of diagnostics including the use of luciferase and ATP (adenosine triphosphate) and the use of loaded enzymes for bioremediation including the clean up of hydrazine spills with specific hydrazine degrading enzymes.

DEPR:

It has now been discovered that biologically active solutes can be loaded into a safe, responsive crosslinked polysaccharide gel networks and demonstrate activity after exposure to thermal and chemical challenges. The biologically active solute may be a solute having a molecular weight greater than about

1,000 and is preferably selected from the group including proteins, polypeptides, nucleoproteins, glycoproteins and lipoproteins. Applications for loaded molecules into safe responsive crosslinked polysaccharide gel networks include, but are not limited to, cosmetic formulations using papain, therapeutics such as peroxidase catalyzed antibacterials or oral hepatitis B vaccine, over the counter products using peroxidase catalyzed antibacterials in mouthwash or toothpaste that require protection of an enzyme from formulation excipients such as sodium dodecyl sulfate, lactose intolerance medications, stabilization of molecular biology enzymes such as restriction endonucleases allowing for greater shipping and storage flexibility with respect to temperature, loading of enzymes into gel networks for use in blood panel diagnostics or other types of diagnostics including the use of luciferase and ATP (adenosine triphosphate) and the use of loaded enzymes for bioremediation including the clean up of hydrazine spills with specific hydrazine degrading enzymes.

DEPR:

A number of applications for the responsive gels of the invention are listed in Gel Science, Inc. brochures "Gel Sciences, the leader in Engineered Response Gels", G001-2/94-10M; "Separations", S001-2/94-10M, and "Controlled Release", CR001-2/94-10M, which are included herein by reference. These applications include: 1) Separations, or reduction in the solvent level, of water or reduction in the water level of a number of products including protein, food protein, other food components; 2) Medical, pharmaceutical and diagnostic applications including electrophoresis, iontophoresis, free drug assay, spinal fluid diagnostics, assay, blood ultracentrifugation, cell culturing, wound dressing, exudate absorption and bacterial indicators; and 3) Toys, in which the toy needs to be biologically inert and safe.

DEPR:

The present invention also provides for the loading of biologically active solutes into safe, responsive crosslinked polysaccharide gel networks in a manner that the activity of the solutes are protected against exposure to thermal and chemical challenges. The compound is a biologically active solute and may be a solute having a molecular weight greater than about 1,000 and is preferably selected from the group including proteins, polypeptides, nucleoproteins, glycoproteins and lipoproteins. Applications for loaded molecules into safe responsive crosslinked polysaccharide gel networks include, but are not limited to, cosmetic formulations using papain, therapeutics such as peroxidase catalyzed antibacterials or oral hepatitis B vaccine, over the counter products using peroxidase catalyzed antibacterials in mouthwash or toothpaste that require protection of an enzyme from formulation excipients such as sodium dodecyl sulfate, lactose intolerance medications, stabilization of molecular biology enzymes such as restriction endonucleases allowing for greater shipping and storage flexibility with respect to temperature, loading of enzymes into gel networks for use in blood panel diagnostics or other types of diagnostics including the use of luciferase and ATP (adenosine triphosphate) and the use of loaded enzymes for bioremediation including the clean up of hydrazine spills with specific hydrazine degrading enzymes.

US-PAT-NO: 5403221

DOCUMENT-IDENTIFIER: US 5403221 A

TITLE: Aerial toy with short axis rotational ascent and long axis rotational descent

DATE-ISSUED: April 4, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Savage, Daniel	San Jose	CA	95125	N/A

US-CL-CURRENT: 446/45,446/36

ABSTRACT:

An aerial toy designed to maintain an aerodynamic profile during ascent by rotating around its shortest axis and having a shape which naturally predicts it to rotate around its longest axis during descent. The body of the invention consists of generally flat, thin, and lightweight, rigid construction (10) with an aerodynamic tapering edge (12). The body has a height that is longer than its width, and one half of the body height has more surface area than the other half.

13 Claims, 6 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: July 13, 1993

----- KWIC -----

TTL:

Aerial toy with short axis rotational ascent and long axis rotational descent

ABPL:

An aerial toy designed to maintain an aerodynamic profile during ascent by rotating around its shortest axis and having a shape which naturally predicts it to rotate around its longest axis during descent. The body of the invention consists of generally flat, thin, and lightweight, rigid construction (10) with an aerodynamic tapering edge (12). The body has a height that is longer than its width, and one half of the body height has more surface area than the other half.

BSPR:

Heretofore elastomer launched aerial toys have been primarily of two types. One type launches up and spins down in a spiral pattern: U.S. Pat. Nos. 4,904,219 to Cox (1990), 4,466,213 to Alberico (1984), 3,665,641 to Henderson (1972), 3,691,674 to Thompson (1972), 2,921,404 to Lescher (1960), 1,413,316 to Bradley (1922). The second type launches up and glides down: U.S. Pat. Nos. 5,013,277 to Hufeld (1991), 4,997,401 to Rose (1991). Previous aerial toys have been launched in a non-rotating fashion with a heavier or thickened end leading the ascent. Weighted areas are necessary to maintain a desirable aerodynamic orientation during flight. If one end of the device is not

weighted more than the other, the toy will rotate during ascent exposing air retarding surfaces that reduce the toy's upward momentum. In addition, the same weights are necessary for the device to maintain a specific desired orientation for a gliding or spinning descent. The necessity of added weight to maintain aerodynamic orientation limits the maximum height of launch, and the time that the toy can stay airborne.

BSPR:

A problem in general with launched aerial toys is that the weight of the toy directly affects the height to which the toy can be launched by the elastic band. A toy that is 10 grams cannot be launched to the same height as a toy that is 5 grams. Most aerial toys have a significant weight, over 5 grams, which limits the height they can be launched. Because the weight limits the maximum height the toy can be launched, the maximum time the toy can stay airborne is also limited. In addition, besides affecting the launch height, the weight also speeds the toy's descent to back to Earth.

BSPR:

Many spinning aerial toys have been patented, all of these are of significant weight limiting their maximum height and time airborne. Some of the toy makers claim that their toy can easily be caught. The fact is unless the toy comes back almost directly to the operator, it will come down too fast to be caught by an average person. Due to a significant weight, the entire flight time of aerial spinning toys is on average about 6-8 seconds. By the time the operator determines which direction to run after the toy, 2 seconds have already passed. If the toy blows away from the operator more than 15.24 meters (50 feet), which is typical, the operator would have to run at speeds in excess of 24.14 kilometers/hour (15 miles/hour) to catch the toy. This is uncomfortably fast for most people. The amusement of catching these devices is only an option when the toy descends near the operator.

BSPR:

To increase the time spent airborne, the toy's weight must be decreased. Unfortunately, the lighter the toy is, the more it will be affected by air resistance during ascent. Previously it has been extremely difficult to launch an aerial toy with a weight of under two grams (superlight) to significant heights (over 15.24 meters, 50 feet) because the force of the air resistance encountered during ascent is more than enough to stop the toy's upward momentum. Air resistance is encountered by the hooking mechanism that allows the toy to be launched, the weighted or thicker areas that help maintain proper orientation during launch, and by the winged surfaces that are necessary for spinning or gliding during descent.

BSPR:

The solution of previous inventors to the air resistance problem during ascent has been to make the toy heavier so it will not be significantly affected by air resistance during the launch. This addition of weight limits the maximum height the toy can be launched and decreases the time the toy stays airborne. On another subject, previous aerial spinning toys have been too narrow and rod-like to incorporate a large variable surface area for amusing shapes, drawings, and pictures.

BSPR:

Besides aerial spinning toys, many aerial gliding toys exist. These toys are subject to the same physics problems as the spinning toys. An additional problem with the aerial glider toys is that the same aerodynamic profile that allows the toy to be launched also causes the toy to return to Earth very quickly unless it happens to catch an updraft. In general, gliding toys return to Earth even faster than the spinning toys. Many attempts have been made for aerial toys to maintain an aerodynamic profile during launch, and then change the profile during the downward return to Earth. These toys which attempt to deploy air retarding surfaces at sometime in the flight contain moving parts that tend to lose their flexibility and break after repeated use: U.S. Pat. Nos. 4,836,817 to Corbin (1989); and 2,105,579 to Baylls (1938).

BSPR:

(a) to provide an elastomer launched aerial toy that is rotated during ascent around its shortest axis providing a rotationally stable aerodynamic profile which allows a superlight object to be launched to heights previously unobtainable.

BSPR:

(b) to provide an aerial toy that maintains an aerodynamic profile during ascent without the addition of weights.

BSPR:

(c) to provide an aerial toy whose lack of weight allows it to be launched higher by the elastomer so it can remain airborne longer than previous elastomer launched toys.

BSPR:

(d) to provide an aerial toy consisting of a generally flattened, thin body shape that is more aerodynamic than previous aerial toys allowing this invention to be launched higher than similar toys.

BSPR:

(e) to provide an aerial toy that changes its aerodynamic profile to one of great air resistance during descent allowing the toy to float slowly back to Earth.

BSPR:

(f) to provide an aerial toy whose generally flattened shape consists of a height that is longer than the width causing the toy to rotate around the longer axis during descent. This rotation causing the toy to fall slowly back to Earth.

BSPR:

(g) to provide an aerial toy whose generally flattened shape consists of one half of the height having a greater surface area than the other half, causing a differential in air resistance that adds a spiraling motion to the rotation around the long axis.

BSPR:

(h) to provide an aerial toy whose lack of weight allows the toy to descend

slower than any previous toy of generally similar operation.

BSPR:

(i) to provide an aerial toy that stays airborne long enough to be easily tracked and caught by the average person.

BSPR:

(j) to provide an aerial toy consisting of a flexible outer edge to prevent injury to the toy and to any person or object hit from an accidental impact.

BSPR:

(k) to provide an aerial toy which has no moving parts that would tend to become inflexible and break after repeated use.

BSPR:

(l) to provide an aerial toy whose generally flattened surface area can be varied and cut into amusing shapes.

BSPR:

(m) to provide an aerial toy whose generally flattened surface area allows for the addition of drawings and pictures to heighten the amusement of the toy.

BSPR:

(n) to provide an aerial toy whose generally flattened surface will allow the addition of light altering or light producing materials.

BSPR:

(o) to provide an aerial toy whose generally flattened surface can be cut to add holes allowing air to resonate and produce sound during ascent.

DEPR:

The interior rigid structure 10 has a surface height that is longer than its width and/or a difference between the amount of surface area contained in the top and bottom half of the invention (height being the longest axis as shown in FIG. 2). The height/width ratio is necessary for the toy to rotate around the long axis during descent. The difference in surface area is necessary for the toy to exhibit a spiraling motion in addition to the rotational motion around the long axis during descent as shown in FIG. 1.

DEPR:

The protective outer surface 12 can be translucent, transparent or opaque. In addition, light producing chemicals such as luminescent paint, or bioluminescent materials may be added to the outer surface for nighttime amusement.

DEPR:

The toy is launched by holding the dowel 16 steady with one hand, placing the toy between the two surfaces of the elastic band 14, as shown in FIG. 3, and pulling the elastic band and the toy down and slightly to the left if being released with the left hand as shown in FIG. 1. When the elastic band is released, it imparts a natural spin on the toy causing it to rotate counterclockwise if being pulled down with the left hand as shown in FIG. 1.

This rotation gives the toy gyroscopic stability or rotational inertia during the launch. The gyroscopic stability allows the toy to maintain its orientation and its aerodynamic profile during ascent. As the toy continues upward, air resistance slows the initial rotation. When the rotation slows enough, the toy loses its gyroscopic stability and begins to become unstable. Because one axis of the toy surface is longer than the other, any perturbation of the toy around the shorter axis causes a rotation around the longer axis as shown in FIG. 1. This new rotation around the longer axis causes the toy to maintain an air retarding profile allowing it to descend very slowly. In addition, if there is a difference between the amount of surface area contained in the top and bottom half of the invention, as shown in FIG. 4, the toy will also exhibit a spiraling pattern caused by a difference in surface area subject to air resistance on each side of the toy. One half of the toy will be pushed by the air resistance more than the other causing the toy to maintain a spiral motion during descent as shown in FIG. 1. If the toy does not have a surface area difference between top and bottom half, it will still rotate around the longer axis and descend very slowly.

DEPR:

Thus the reader will see that the aerial toy of my invention overcomes the air resistance problems previously encountered in attempts to launch a superlight toy to significant heights, thus providing a higher flying, slower descending aerial toy than has been designed previously. In addition, because my invention can stay airborne longer than previous similar inventions, it can be tracked and caught more easily. Lastly, my invention has a variable surface area that can be cut into amusing shapes which can further be enhanced by the addition of colored designs, light altering materials, and light producing materials.

CLPR:

1. An aerial toy for projecting up into the air and free fall comprising:

CLPR:

2. An aerial toy of claim 1 wherein said first surface and second surface are covered by respective first and second covers of a flexible material, and said first and second covers are integrally formed with said tapered edge.

CLPR:

4. An aerial toy for projecting up into the air and free fall comprising:

CLPR:

5. The aerial toy of claim 4 wherein said first half of said body is in the shape of an oval, and said second half of said body is in the shape of a triangle intersecting said oval.

CLPR:

6. The aerial toy of claim 4 further comprising an elastomeric launching mechanism consisting of an elastomer, having means for engaging said body, attached to a rigid piece whereby a user may grasp the rigid piece in one hand and launch said body by said elastomer.

CLPR:

7. The aerial toy of claim 4 further comprising a symmetrically tapered edge of a flexible material extending continuously around the periphery of said body except for a single break adapted for allowing said launcher to engage said body during launching.

CLPR:

8. The aerial toy of claim 7 wherein said planar first surface and said planar second surface are covered by respective first and second covers of a flexible material, and said first and second covers are integrally formed with said tapered edge.

CLPR:

9. The aerial toy of claim 4 wherein said body has holes with means for producing sound.

CLPR:

10. The aerial toy of claim 4 further comprising lighting means for lighting said planar first surface and said planar second surface.

CLPR:

11. The aerial toy of claim 10 wherein said lighting means is chosen from the group consisting of bioluminescent chemicals, luminescent paint, and light emitting diodes.

CLPR:

12. The aerial toy of claim 4 further comprising light altering materials.

CLPR:

13. The aerial toy of claim 12 wherein said light altering materials are chosen from the group consisting of diffraction materials, iridescent materials, and fluorescent materials.

CLPV:

a generally flat, thin body of a lightweight material having a planar first surface and a planar second surface defining a uniform thickness and weight throughout said body, said body further having a height longer than a width defining an elongated shape having a longitudinal axis and a lateral axis, said lateral axis being perpendicular to said planar first surface and said planar second surface, said lateral axis passing through a point central to said body, said aerial toy having at least four operational modes including:

	L #	Hits	Search Text	DBs	Time Stamp
1	L1	9471	biolumines\$ or fluorescen\$ near4 protein\$1 or luciferase\$1 or photoprotein\$1	USPAT; US-PGPUB	2002/05/08 12:44
2	L2	2157	gun near5 (toy or squirt or water)	USPAT; US-PGPUB	2002/05/08 12:44
3	L3	8	1 and 2	USPAT; US-PGPUB	2002/05/08 12:44
4	L4	53179	chemilumines\$ or lumines\$8 or glow\$8	USPAT; US-PGPUB	2002/05/08 12:45
5	L5	58	(4 and 2) not 1	USPAT; US-PGPUB	2002/05/08 12:45
6	L6	62616	toy or novelty	USPAT; US-PGPUB	2002/05/08 12:46
7	L7	112	6 and 1	USPAT; US-PGPUB	2002/05/08 12:46
8	L8	11	6 same 1	USPAT; US-PGPUB	2002/05/08 12:46
9	L9	5	8 not 3	USPAT; US-PGPUB	2002/05/08 12:46
10	L10	13	1 and toy	USPAT; US-PGPUB	2002/05/08 12:46
11	L11	6	10 not 3	USPAT; US-PGPUB	2002/05/08 12:46
12	L12	16	1 and novelty adj item\$1	USPAT; US-PGPUB	2002/05/08 12:47
13	L13	10	12 not 3	USPAT; US-PGPUB	2002/05/08 12:47

PGPUB-DOCUMENT-NUMBER: 20010036073
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010036073 A1

TITLE: Carvable decorative gourd

PUBLICATION-DATE: November 1, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Trease, Christine K.	Price	UT	US	

US-CL-CURRENT: 362/154,362/122 ,362/124 ,362/808

ABSTRACT:

An artificial hollow carvable gourd shaped as a pumpkin, squash, or other fruit or vegetable, having an outer carvable shell, which encases fake "innards and seeds" made of edible candy, and including a prize, contained therein to provide a more realistic gourd container.

DATE FILED: April 19, 2001

----- KWIC -----

BSTX:

[0007] Cited for general interest is Bryan, U.S. Pat. No. 5,876,995, which discloses bioluminescent novelty items, which can have a Halloween theme.

DETX:

[0030] The carvable gourd container 10 thus provides an ideal candy container convertible into a toy or novelty item suitable for decorative holiday use or play.

PGPUB-DOCUMENT-NUMBER: 20010010367
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010010367 A1

TITLE: Luminescent gel coats and moldable resins

PUBLICATION-DATE: August 2, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Burnell-Jones, Peter	Burleigh Gardens		AU	

US-CL-CURRENT: 252/301.36

ABSTRACT:

Luminescent polymers are prepared from thermosetting unsaturated polyesters, suspending fillers and phosphorescent pigments and utilized to make gel coated articles and molded, cast and fiberglass reinforced plastic (FRP) articles. The luminescent polymers show bright and long-lasting photoluminescent afterglow, strong thermostimulation of afterglow by heat and electroluminescent properties. The preferred thermosetting unsaturated polyester resins are prepared by condensing mixtures of ethylenically unsaturated and aromatic dicarboxylic acids and anhydrides with dihydric alcohols and a polymerizable vinylidene monomer. Phthalic (orthophthalic) and isophthalic aromatic modified polyesters and their substituted derivatives are preferred, particularly those formed from maleate or fumarate unsaturated dicarboxylic acids and anhydrides and a glycol or mixtures of glycols. The preferred monomer is styrene. Preferred suspending fillers and thixotropic modifiers include silica, microspheres, glass fibers and other short fibers, nepheline syenite, feldspar, mica, pumice, magnesium sulfate, calcium carbonate, bentonite and the various clays and thixotropic modifiers and mixtures thereof. Preferred phosphorescent pigments include alkaline earth aluminate phosphors, zinc sulfide phosphors and mixtures of these phosphors. The luminescent resins may be rendered fire retardant and made flexible. As the heavy phosphorescent pigments remain in suspension, the raw luminescent resins are suitable for long-term storage and use.

DATE FILED: January 18, 2001

----- KWIC -----

BSTX:

[0005] Examples of luminescence are the dim glow of phosphorus (a chemiluminescence), the phosphorescence of certain solids (phosphors) after exposure to sunlight, X-rays or electron beams, the transitory fluorescence of

many substances when excited by exposure to various kinds of radiation, the aurora borealis and the electroluminescence of gases when carrying a current, the triboluminescence of crystals when rubbed or broken, the bioluminescence of many organisms, including the firefly, the glowworm and the "burning of the sea," the fungus light of decaying tree trunks, and the bacterial light of dead flesh or fish.

DETX:

[0194] Examples of the invention described above have been made and tested and found to deliver the advantages described. The luminescent polymers have been utilized as a gel coat on items including automobiles, hubcaps, bicycles (frame and wheel rims), signs, boats (exterior trim), trailers, outboard motor covers, fishing poles and banners. The luminescent polymers have been further utilized to mold items including safety and bicycle helmets, a dinghy runabout boat, house numbers and letters, keys for musical keyboards, skateboards, scratchplates for guitars, light switch and door handle surrounds, doors, smoke detector covers, knife and tool handles, telephones, floor tiles, ceiling and wall panels, stair treads, seat inserts and table tops, printed circuit boards, headlight and light reflectors, solar cell lens, spa baths and vanity basins, watch and clock faces, cats eye road markers, mouse and rat traps, flying insect catchers, walking sticks, lamp stands, remote controlled car bodies, battery covers for trucks, fishing lures, fiberglass rocks for use in spas and novelty items. Flexible items made and tested have included fishing nets, clothing and ship's pennants.

US-PAT-NO: 6207077

DOCUMENT-IDENTIFIER: US 6207077 B1

TITLE: Luminescent gel coats and moldable resins

DATE-ISSUED: March 27, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Burnell-Jones; Peter	Burleigh Gardens	N/A	N/A	AUX

US-CL-CURRENT: 252/301.36, 428/690, 523/514, 523/521, 523/526, 524/403, 524/418, 524/420, 524/423, 524/427, 524/437, 524/442, 524/449, 524/783, 524/786, 524/787, 525/12, 525/15, 525/23

ABSTRACT:

Luminescent polymers are prepared from thermosetting unsaturated polyesters, suspending fillers and phosphorescent pigments and utilized to make gel coated articles and molded, cast and fiberglass reinforced plastic (FRP) articles. The luminescent polymers show bright and long-lasting photoluminescent afterglow, strong thermostimulation of afterglow by heat and electroluminescent properties. The preferred thermosetting unsaturated polyester resins are prepared by condensing mixtures of ethylenically unsaturated and aromatic dicarboxylic acids and anhydrides with dihydric alcohols and a polymerizable vinylidene monomer. Phthalic (orthophthalic) and isophthalic aromatic modified polyesters and their substituted derivatives are preferred, particularly those formed from maleate or fumarate unsaturated dicarboxylic acids and anhydrides and a glycol or mixtures of glycols. The preferred monomer is styrene. Preferred suspending fillers and thixotropic modifiers include silica, microspheres, glass fibers and other short fibers, nepheline syenite, feldspar, mica, pumice, magnesium sulfate, calcium carbonate, bentonite and the various clays and thixotropic modifiers and mixtures thereof. Preferred phosphorescent pigments include alkaline earth aluminate phosphors, zinc sulfide phosphors and mixtures of these phosphors. The luminescent resins may be rendered fire retardant and made flexible. As the heavy phosphorescent pigments remain in suspension, the raw luminescent resins are suitable for long-term storage and use.

23 Claims, 0 Drawing figures

Exemplary Claim Number: 1

DATE FILED: October 13, 1998

----- KWIC -----

BSPR:

Examples of luminescence are the dim glow of phosphorus (a chemiluminescence), the phosphorescence of certain solids (phosphors) after exposure to sunlight, X-rays or electron beams, the transitory fluorescence of many substances when excited by exposure to various kinds of radiation, the aurora borealis and the electroluminescence of gases when carrying a current, the triboluminescence of crystals when rubbed or broken, the bioluminescence of many organisms, including the firefly, the glowworm and the "burning of the sea," the fungus

light of decaying tree trunks, and the bacterial light of dead flesh or fish.

DEPR:

Examples of the invention described above have been made and tested and found to deliver the advantages described. The luminescent polymers have been utilized as a gel coat on items including automobiles, hubcaps, bicycles (frame and wheel rims), signs, boats (exterior trim), trailers, outboard motor covers, fishing poles and banners. The luminescent polymers have been further utilized to mold items including safety and bicycle helmets, a dinghy runabout boat, house numbers and letters, keys for musical keyboards, skateboards, scratchplates for guitars, light switch and door handle surrounds, doors, smoke detector covers, knife and tool handles, telephones, floor tiles, ceiling and wall panels, stair treads, seat inserts and table tops, printed circuit boards, headlight and light reflectors, solar cell lens, spa baths and vanity basins, watch and clock faces, cats eye road markers, mouse and rat traps, flying insect catchers, walking sticks, lamp stands, remote controlled car bodies, battery covers for trucks, fishing lures, fiberglass rocks for use in spas and novelty items. Flexible items made and tested have included fishing nets, clothing and ship's pennants.

US-PAT-NO: 6126870

DOCUMENT-IDENTIFIER: US 6126870 A

TITLE: Chemiluminescent labeling compounds

DATE-ISSUED: October 3, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Akhavan-Tafti; Hashem	Howell	MI	N/A	N/A

US-CL-CURRENT: 252/700,435/4 ,435/5 ,435/6 ,435/7.1 ,544/212 ,544/96 ,546/102 ,546/103 ,546/104

ABSTRACT:

Chemiluminescent labeling compounds and chemiluminescent labeled conjugates are provided. The compounds comprise an acridan ring bearing an exocyclic double bond and further contain a labeling substituent which permits attachment to compounds of interest. The novel chemiluminescent compounds and labeled conjugates generated chemiluminescence rapidly after undergoing a reaction with an acid, an oxidant and a base. The compounds and conjugates are useful in assays of an analyte in a sample and in assays employing labeled specific binding pairs.

22 Claims, 4 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: June 17, 1998

----- KWIC -----

BSPR:

While many large molecules are used as labels, including enzymes and the photoprotein aequorin, their use suffers the disadvantage of limiting the number of labels which can be attached to the target species and having the tendency of depositing non specifically on supports and surfaces.

BSPR:

The present invention relates generally to methods of generating chemiluminescence and compounds for use in these methods. The methods use acridan compounds and simple, inexpensive and readily available reagents for generating chemiluminescence therefrom. The light producing reaction can be used for a number of art-recognized purposes, including analytical methods of assay, signaling, emergency lighting and novelty items.

US-PAT-NO: 6017769

DOCUMENT-IDENTIFIER: US 6017769 A

TITLE: Non-enzymatic methods of generating chemiluminescence from acridan alkenes

DATE-ISSUED: January 25, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Akhavan-Tafti; Hashem	Howell	MI	N/A	N/A

US-CL-CURRENT: 436/544, 435/26, 435/28, 435/6, 435/7.1, 435/968, 436/546, 436/800, 436/805

ABSTRACT:

Methods of generating chemiluminescence rapidly without the use of enzymes are provided. The methods utilize chemiluminescent compounds comprising an acridan ring bearing an exocyclic double bond in a reaction with an acid, an oxidant and a base. The chemiluminescent methods are useful in assays to detect the amount of an analyte in a sample. The chemiluminescent compounds may be supplied as a label on an analyte or a specific binding partner or may be encapsulated within a liposome or latex particle.

35 Claims, 4 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

DATE FILED: June 17, 1998

----- KWIC -----

BSPR:

While many large molecules are used as labels, including enzymes and the photoprotein aequorin, their use suffers the disadvantage of limiting the number of labels which can be attached to the target species and having the tendency of depositing non-specifically on supports and surfaces.

BSPR:

The present invention relates generally to methods of generating chemiluminescence and compounds for use in these methods. The methods use acridan alkenes and simple, inexpensive and readily available reagents for generating chemiluminescence therefrom. The light producing reaction can be used for a number of art-recognized purposes, including analytical methods of assay, signaling, emergency lighting and novelty items.

ORPL:

H. Akhavan-Tafti et al, Bioluminescence and Chemiluminescence, Molecular Reporting with Photons, Proceedings of the 9th Internat'l Symp. on Biolumin. and Chemilumin. held at Woods Hole, MA, Oct. 1996, pp. 311-314, 1997.

US-PAT-NO: 5931383

DOCUMENT-IDENTIFIER: US 5931383 A

TITLE: Self-illuminated drinking straw

DATE-ISSUED: August 3, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Palmer; William R.	Cameron Park	CA	N/A	N/A
Palmer; Stephen L.	Cameron Park	CA	N/A	N/A

US-CL-CURRENT: 239/33

ABSTRACT:

The instant invention provides for illuminated drinking straws which employ chemiluminescent mixtures as lighting sources. The illuminated drinking straw may be used with either hot or cold beverage such as water, fruit juices, soft drinks, coffees and teas, milk products or alcoholic beverages. A new and exciting drinking straw for amusement purposes is intended.

24 Claims, 23 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 12

DATE FILED: February 3, 1998

----- KWIC -----

BSPR:

Other non-incandescent, chemical means of producing light which may be advantageously employed include bioluminescent systems, or alternately, chemiluminescent systems based on dioxetanes or other chemiluminescent reagents. Toy and novelty applications which utilizes bioluminescent systems are taught in PCT-WO 97/29319.

BSPR:

The instant invention is directed to the use of a chemiluminescent device in combination with a drinking straw. The unique lighting effects generated from chemiluminescent lighting devices are enhanced by the inherent optical properties of beverages. Beverage fluid motion, color, clarity and degree of effervescence, if any, all serve to add to the interest of the instant invention. While chemiluminescence has been employed to produce various forms of illuminated drinking vessels and novelty items such as "swizzle" sticks, heretofore no device has been produced which utilizes the intrinsically interesting nature of beverage fluid travel in transparent or partially transparent tubes or drinking straws.

BSPR:

For example, if the chemiluminescent device is producing a generally green or yellow light and a red beverage is drawn up through the device, the red beverage can filter out certain spectral portions of the chemiluminescent light to produce an apparent color change. Some dyes or coloring agents can be used

not only as color filters but as fluorescers. A fluorescent dye functions by converting light of one wavelength to another wavelength. For example, blue light from a chemiluminescent device might be converted to red light by employing an appropriate fluorescer. This red light could be produced even if there was little or no red light emitted by the chemiluminescent device. U.S. Pat. No. 4,379,320 teaches to the use of secondary fluorescers similar to those described above. Of course, if such dyes or fluorescers were to be incorporated into a beverage it is necessary that they be completely safe for consumption. A variety of fluorescent proteins exist which may be used in this application, the use of said proteins being taught in PCT-WO 97/29319.

US-PAT-NO: 5858693

DOCUMENT-IDENTIFIER: US 5858693 A

TITLE: Device and method for phage-based antibiotic susceptibility testing

DATE-ISSUED: January 12, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cottingham; Hugh V.	Caldwell	NJ	N/A	N/A

US-CL-CURRENT: 435/8,435/32 ,435/4 ,435/5 ,436/149 ,436/63

ABSTRACT:

A phage-based antibiotic susceptibility test is carried out by maintaining a patient sample in a sealed sample well during addition of the phage and Luciferin substrate used in the test, in order to prevent contamination of the laboratory environment. The phage is adhered in dried form to a metal carrier disk which is retained beneath the cap of the sealed sample well by means of an external magnet, and is mixed with the patient sample by removing the external magnet and allowing the carrier disk to fall to the bottom of the sample well. The Luciferin substrate is adhered to the underside of the cap and is mixed with the patient sample by shaking or inverting the sealed sample well after the metal carrier disk has separated from the underside of the cap. A row of connected sample wells and caps may be employed to allow the same patient sample to be tested with multiple antibiotics.

3 Claims, 10 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 10

DATE FILED: June 27, 1997

----- KWIC -----

BSPR:

While culture methods are useful in determining which antibiotic will be effective, they are very time-consuming, requiring as much as twelve weeks to determine antibiotic susceptibility. The resulting delay in beginning treatment can allow the disease to progress further, sometimes to the point where the patient dies. Recently, a new method has been developed which reduces the time necessary to determine antibiotic susceptibility to as little as two days. This method, which is disclosed in U.S. Pat. No. 4,861,709 to Ulitzur et al incorporated herein by reference, uses a specific bacteriophage which has the ability to infect the disease-causing bacteria. The phage causes the infected bacteria to produce an enzyme known as Luciferase. Luciferase is a well-known enzyme which, when combined with the substrate Luciferin, causes the substrate to emit light. In a phage-based test for antibiotic susceptibility, a patient sample is cultured individually with each antibiotic for a day or two. The phage is then added to the sample and incubated for a few hours, after which the Luciferin substrate is added. The sample is then observed for the presence of luminescence. If luminescence is present, the bacteria are still alive and the antibiotic with which they were initially

cultured was not effective against them. If there is no observed luminescence, the bacteria are dead and the antibiotic with which they were initially cultured was effective against them.

DEPR:

The flexible magnetic strip 24 is preferably of the well-known type that is often used for so-called "refrigerator magnets" and similar types of novelty items. Extruded flexible magnetic strips of this type are available from Master Magnetics, Inc. of Castle Rock, Colo. as Product No. ZG-38. The flexibility of the magnetic strip 24, while not essential, allows it to be removed more easily from the cap strip 22 during the antibiotic susceptibility test. The metal carrier disks 26 may be made of any ferromagnetic metal, such as steel, and may consist of composite structures rather than solid metal. Examples of such composite structures include metal-coated plastic disks, plastic disks with embedded metal bodies or particles, and so on. It will also be appreciated that roles of the flexible magnetic strip 24 and metal carrier disks 26 may be interchanged, that is, the metal carrier disks 26 may be replaced with magnets and the flexible magnetic strip 24 may be replaced with a flexible metal or composite strip. As a further modification, the strip 24 and carrier disks 26 may both comprise magnets, with opposite poles positioned adjacent to each other. The top surface of the flexible strip 24 may be imprinted with a company logo or product name, instructions for use of the apparatus 10, or other printed information, either on the strip 24 directly or on a separate layer (not shown) adhered to its upper surface.

DEPR:

Following the phage incubation period, the Luciferin substrate 40 that is adhered to the underside of the caps 28 is mixed with the liquid biological sample 50. This is accomplished by either shaking or inverting the apparatus 10, or both, to bring the liquid biological samples 50 into contact with the dried Luciferin substrate 40. This causes the liquid biological samples 50 to dissolve the Luciferin substrate 40, leaving the apparatus in the condition shown in FIG. 7C. The metal carrier disks 26, which are now free to move within the sample wells 12, serve as agitators to promote mixing between the samples 50 and the Luciferin substrate 40 during shaking or inversion of the apparatus 10. In FIG. 7D, a detection step is carried out by detecting any luminescence in the liquid biological samples caused by the combination of Luciferase (produced by live bacteria) with the Luciferin substrate. In order to avoid the need to open or unseal the sample wells 12 during the detection step, the caps 28 and cap strip 22 are preferably made either transparent or translucent, as noted earlier, so that any luminescence produced by the liquid biological samples 50 can be detected from the top of the sealed assembly 10. An automated instrument such as a luminometer is preferably used in the detection step, but the detection step can also be carried out manually if desired. In the example shown in FIG. 7D, the luminescence produced by the rightmost sample well 12 indicates that the bacteria in the liquid biological sample 50 are still alive, and hence that the antibiotic used in that sample well 12 was not effective to kill the bacteria. The lack of luminescence in the adjacent sample well 12 indicates that the bacteria in that sample well 12 are no longer viable, and hence that the antibiotic used in that sample well is effective against the particular bacterium in the patient sample. Similar results (i.e., either luminescence or non-luminescence) will be produced by the

remaining sample wells 12 of the apparatus 10.

CLPV:

said reagent comprises a bacteriophage which induces luciferase production by said bacterium; and

CLPV:

said second reagent comprises luciferase.

US-PAT-NO: 5840963

DOCUMENT-IDENTIFIER: US 5840963 A

TITLE: Chemiluminescent reactions using dihydroxyaromatic compounds and heterocyclic enol phosphates

DATE-ISSUED: November 24, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Akhavan-Tafti; Hashem	Brighton	MI	N/A	N/A

US-CL-CURRENT: 562/23,562/25

ABSTRACT:

Novel methods and compositions which generate chemiluminescence are provided. The compositions comprise a heterocyclic enol phosphate compound and a dihydroxyaromatic compound in which the two hydroxy groups are separated by an even number of ring carbon atoms. Novel methods and compositions for generating chemiluminescence by reaction with a hydrolytic enzyme are provided as well. The compositions comprise a heterocyclic enol phosphate compound and a protected dihydroxyaromatic compound in which one of the hydroxy groups of the dihydroxyaromatic compound is protected with an enzyme-cleavable group. The novel chemiluminescent compositions are useful in methods for producing chemiluminescence for use in assays of hydrolytic enzymes and enzyme inhibitors and in assays employing labeled specific binding pairs.

3 Claims, 8 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 8

DATE FILED: February 10, 1998

----- KWIC -----

BSPR:

d. Luciferin Derivatives. Phosphate and galactoside derivatives of firefly luciferin are known (N. Ugarova, Y. Vosny, G. Kutuzova, I. Dementieva, *Biolum. and Chemilum. New Perspectives*, P. Stanley and L. J. Kricka, eds., Wiley, Chichester, 511-4 (1981); W. Miska, R. Geiger, J. Biolumin. *Chemilumin.*, 4, 119-28 (1989)). Treatment of the firefly luciferin derivative with the appropriate enzyme liberates firefly luciferin which is reacted in a second step with luciferase and ATP to produce light.

DEPR:

The chemiluminescent reactions of the present invention comprising the reaction of compounds of formula I and III in the presence of oxygen may find use as chemical light sources, an example of which is the familiar light stick and related novelty items or for emergency lighting. Another use is in methods of detecting a compound of formula I in a sample in biomedical analysis, food analysis or environmental analysis of pollutants.

US-PAT-NO: 5772926

DOCUMENT-IDENTIFIER: US 5772926 A

TITLE: Chemiluminescent reactions using dihydroxyaromatic compounds and heterocyclic enol phosphates

DATE-ISSUED: June 30, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Akhavan-Tafti; Hashem	Brighton	MI	N/A	N/A

US-CL-CURRENT: 252/700,435/4

ABSTRACT:

Novel methods and compositions which generate chemiluminescence are provided. The compositions comprise a heterocyclic enol phosphate compound and a dihydroxyaromatic compound in which the two hydroxy groups are separated by an even number of ring carbon atoms.

Novel methods and compositions for generating chemiluminescence by reaction with a hydrolytic enzyme are provided as well. The compositions comprise a heterocyclic enol phosphate compound and a protected dihydroxyaromatic compound in which one of the hydroxy groups of the dihydroxyaromatic compound is protected with an enzyme-cleavable group.

The novel chemiluminescent compositions are useful in methods for producing chemiluminescence for use in assays of hydrolytic enzymes and enzyme inhibitors and in assays employing labeled specific binding pairs.

72 Claims, 8 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 8

DATE FILED: May 13, 1997

----- KWIC -----

BSPR:

d. Luciferin Derivatives. Phosphate and galactoside derivatives of firefly luciferin are known (N. Ugarova, Y. Vosny, G. Kutuzova, I. Dementieva, *Biolum. and Chemilum. New Perspectives*, P. Stanley and L. J. Kricka, eds., Wiley, Chichester, 511-4 (1981); W. Miska, R. Geiger, J. Biolumin. *Chemilumin.*, 4, 119-28 (1989)). Treatment of the firefly luciferin derivative with the appropriate enzyme liberates firefly luciferin which is reacted in a second step with luciferase and ATP to produce light.

DEPR:

The chemiluminescent reactions of the present invention comprising the reaction of compounds of formula I and III in the presence of oxygen may find use as chemical light sources, an example of which is the familiar light stick and related novelty items or for emergency lighting. Another use is in methods of detecting a compound of formula I in a sample in biomedical analysis, food

analysis or environmental analysis of pollutants.

US-PAT-NO: 5554035

DOCUMENT-IDENTIFIER: US 5554035 A

TITLE: **Bioluminescent** algae in light bulb shaped viewing device

DATE-ISSUED: September 10, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gooch; Van D.	Morris	MN	56267	N/A

US-CL-CURRENT: 434/297,119/245

ABSTRACT:

The present invention relates to an apparatus for viewing luminescence of algae. The apparatus comprises **bioluminescent**, dinoflagellate algae, an aqueous solution in which the **bioluminescent** algae can live, and a translucent light bulb shaped container for holding the **bioluminescent** algae in the aqueous solution.

8 Claims, 1 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 1

DATE FILED: July 1, 1994

----- KWIC -----

TTL:

Bioluminescent algae in light bulb shaped viewing device

ABPL:

The present invention relates to an apparatus for viewing luminescence of algae. The apparatus comprises **bioluminescent**, dinoflagellate algae, an aqueous solution in which the **bioluminescent** algae can live, and a translucent light bulb shaped container for holding the **bioluminescent** algae in the aqueous solution.

BSPR:

The present invention relates generally to an educational and novelty device for viewing **bioluminescent** algae. In particular, the present invention relates to a light bulb shaped viewing device containing **bioluminescent** algae.

BSPR:

One such scientific phenomenon that is particularly intriguing is luminescence. Prior art devices have attempted to encourage an interest in **bioluminescence** by placing **bioluminescent** algae in a clear cylindrical glass or plastic container to enable the **bioluminescence** to be viewed. The cylindrical container requires minimal care and provides a convenient means by which people can view **bioluminescence**.

BSPR:

The present invention relates to an apparatus for viewing luminescence of

algae. The apparatus comprises bioluminescent, dinoflagellate algae, an aqueous solution in which the bioluminescent algae can live, and a translucent light bulb shaped container for holding the bioluminescent algae in the aqueous solution.

DEPR:

A device according to the present invention includes a light bulb shaped container containing bioluminescent, dinoflagellate algae and an aqueous solution. The device provides a simple and educational mechanism for viewing bioluminescence.

DEPR:

By placing bioluminescent algae in a light bulb shaped container, children and adults are given the opportunity to view one of nature's more intriguing processes. Similar to a conventional light bulb, which emits light when turned on, the bioluminescent algae in the light bulb shaped container emit light when shaken. Because of the resemblance of the light bulb shaped bioluminescence viewing device to a light bulb, the device creates a greater interest in luminescence than merely placing the bioluminescent algae in a cylindrical container. As a result of the greater interest in luminescence, the device of the present invention stimulates a greater interest in science.

DEPR:

The phenomenon of bioluminescence is not a phenomenon that people commonly see. Certainly most people are rarely able to produce bioluminescence at will in their own home. Furthermore, there is a fascination of being able to photosynthetically grow marine algae in one's home with minimal care. Hopefully, the ability to grow algae and view the luminescence will encourage people to better appreciate the importance of the wide diversity of organisms on our planet. It is also hoped that the device of the present invention stimulates curiosity and awe and the realization that there must be many more things that we do not yet fully understand.

DEPR:

The bioluminescent algae selected for use in the device of the present invention display a bright luminescence in response to agitation. The bioluminescent algae are also sufficiently hardy so that a significant proportion of the algae remain alive while the device is handled prior to and after sale to a consumer. There are several genera of bioluminescent, photosynthetic, dinoflagellate algae that are suitable for use with the present invention. Preferably, the genera include Pyrocystis, Dissodinium, Noctiluca, Gonyaulax, Peridinium, Pyrodinium, and Ceratium. The preferred species that exhibits the best balance between luminescence and durability is Pyrocystis lunula. This species has also been known as Dissodinium lunula.

DEPR:

Because the bioluminescent algae are photosynthetic, they need light to carry out photosynthesis. While the algae can survive for 4-7 days without light, at least 5 hours per day of indirect light from a window or light from a 40 Watt fluorescent bulb is needed for good survival of Pyrocystis.

DEPR:

The algae placed in the light bulb shaped container only luminesce when the surroundings are dark. Once the surroundings are changed from dark to light, the ability of the algae to luminesce drops significantly. The process of changing the surroundings from dark to light is referred to as photoinhibition. The amount of the photoinhibition depends on the intensity of the light. For example, in the presence of a fluorescent light the ability to luminesce drops to about half in 5 minutes and drops to 10% in about 15 minutes for *Pyrocystis* as described by W. H. Biggley et al., Stimulable and Spontaneous **Bioluminescence** in the Marine Dinoflagellates, *Pyrodinium bahamense*, *Gonyaulax polydora*, and *Pyrocystis lunula*, 54 J. GEN. PHYSIOLOGY 96-122 (1972). After being fully photoinhibited, the algae can recover by placing them back into the dark. To achieve 50% recovery takes about 5 minutes and 90% recovery takes 15 minutes.

DEPR:

Another issue that must be addressed when selecting algae for use in the device of the present invention is when the luminescence can be viewed. Some of the dinoflagellates show strong internal daily cycles called circadian rhythms. As a result, the algae may not be capable of luminescence or full luminescence even when placed in the dark if it is during the normal day phase of their cycle. The *Pyrocystis* are preferable for use in the present invention because the *Pyrocystis* only weakly shows circadian rhythms as described by Elijah Swift & Valerie Meunier, Effects of Light Intensity on Division Rate, Stimulable **Bioluminescence** and Cell Size of the Oceanic Dinoflagellates *Dissodinium Lunula*, *Pyrocystis Fusiformis*, and *P. Noctiluca*, 12 J. PHYCOLOGY 14-22 (1976). On the other hand, *Gonyaulax* are less preferably because the *Gonyaulax* exhibits strong circadian rhythms.

DEPR:

For most types of algae, the **bioluminescence** is only seen upon agitation of the organisms. While *Pyrocystis* are not detrimentally affected by agitation, agitation may be quite harmful to *Gonyaulax*. The algae can be repeatedly agitated to luminescence for about 5 minutes. After this point, the algae must be allowed to regenerate for a day cycle.

DEPR:

When selecting the **bioluminescent** algae for use in the device of the present invention, there is an additional concern that the **bioluminescent** algae must not be toxic to humans. Toxicity is especially important because the **bioluminescence** of the algae is particularly intriguing to young children.

DEPR:

Bioluminescent algae toxicity questions typically arise when there are large shell fish kills. The shell fish kills are frequently linked to shell fish consuming large amounts of certain species of **bioluminescent** dinoflagellates and concentrating certain chemicals from those algae.

DEPR:

The preferred algae, *Pyrocystis*, used in the present invention have never been implicated as one of the dinoflagellates involved in shell fish poisoning as described by Karen A. Steidinger & Daniel G. Baden, Toxic Marine Dinoflagellates, in DINOFLAGELLATES 201-61 (David Spector, ed., 1984). If one

drank a culture of the dinoflagellates from the device of the present invention, it is highly unlikely that there would be a sufficiently high concentration of toxins to have a detrimental effect. For purposes of incorporating the **bioluminescent** algae into a **novelty item**, no species that was known to be involved in shell fish poisoning is used.

DEPR:

The algae and the aqueous solution are then placed in the bulb 12. The algae and the aqueous solution preferably fill approximately 2/3 times of the bulb 12. After the **bioluminescent** algae and the aqueous solution are placed in the bulb 12, the cap 14 is screwed on the bulb 12. The cap 14 tightly engages the bulb 12 so as to prevent leakage of the algae and the aqueous solution from the container 10.

CLPR:

1. An apparatus for viewing luminescence of algae, the apparatus comprising: **bioluminescent**, dinoflagellate algae;

CLPR:

2. The apparatus of claim 1 wherein the **bioluminescent**, dinoflagellate algae are selected from the group consisting of the following genera: Pyrocystis, Dissodinium, Noctiluca, Gonyaulax, Peridinium, Pyrodinium, and Ceratium.

CLPV:

an aqueous solution in which the **bioluminescent** algae can live; and

CLPV:

a light bulb shaped container having a bulbous portion and a neck portion extending from the bulbous portion, the light bulb shaped container holding the **bioluminescent** algae and the aqueous solution, at least a portion of the light bulb shaped container being translucent, where in the aqueous solution has the following composition:

ORPL:

Elijah Swift & Valerie Meunier, Effects of Light Intensity on Division Rate, Stimulable **Bioluminescence** and Cell Size of the Oceanic Dinoflagellates Dissodinium lunula, Pyrocystis fusiformis, and P. noctiluca, 12 J. Phycology 14-22 (1976).

ORPL:

W. H. Biggley et al., Stimulable and Spontaneous **Bioluminescence** in the Marine Dinoflagellates, Pyrodinium bahamense, Gonyaulax polydera, and Pyrocystis lunula, 54 J. Gen. Physiology 96-122 (1972).